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June 94.

By Asa Gray.

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Ætat 76

Asa Gray

LETTERS OF ASA GRAY

EDITED BY

JANE LORING GRAY

IN TWO VOLUMES

VOL. II.



BOSTON AND NEW YORK
HOUGHTON, MIFFLIN AND COMPANY
The Riverside Press, Cambridge
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Note on the Illustrations. The frontispiece portrait of Dr. Gray is a photogravure from a photograph taken in 1886. The plate of Dr. Gray in his study, facing page 529, is from a photograph taken in 1879. The view of the present Range of Buildings in the Botanic Garden, facing page 614, is from a photograph taken for this work.

LETTERS OF ASA GRAY.

CHAPTER V.

SECOND JOURNEY IN EUROPE. — CORRESPONDENCE.

1850–1859.

Dr. Gray sailed for England with Mrs. Gray in a sailing packet June 11, 1850. The steamers made regular trips, but the fine packets were still running, and it was thought desirable to try the longer voyage for Mrs. Gray's health.

Dr. Gray renewed acquaintance with his old friends, and made many new ones, meeting at his friend Mr. Ward's, where they first stayed, many of the younger men, Henfrey, Forbes, etc., who had become known in science since his former visit in 1839.

TO JOHN TORREY.

Ghent, Belgium, July 16, 1850.

I surely meant that you should have heard of us long ere this. But there seemed not to be a moment of time during the fortnight we spent in England; Mr. Ward kept us so busy with every sort of engagement and sight-seeing that J. could enjoy. I meant to have written at Dover last evening; but it was not convenient, so now that we are for the first night in a strange country (which England is not) I must tell you, what I trust you have learned from Carey (to whom I had occasion to write hurriedly, last mail), that we had a very pleasant voyage of seventeen and

a half days and came near making it in fourteen, as we made land early on the morning of the twelfth day out, no storms, but gentle favoring breezes till we made the Irish coast; and then, to our disappointment, we had head winds to beat against all the way up to Holyhead, and reached Liverpool Saturday morning. . . .

On Monday we left Liverpool, which has vastly improved since you saw it; stopping at Coventry and turning off to Leamington to see, at Darlington's desire, the descendants of old Peter Collinson,[1] and deliver some books and letters from him, which I did. Mrs. Collinson was ill with a severe fall, but her daughter received the things I brought, and showed me a portrait of Peter. Then Mrs. Gray and I made an excursion to Warwick Castle, the fine ruins of Kenilworth, and Stoneleigh Abbey, driving through six or seven miles of fine park. The next day on to London, to Ward, who had insisted on our visiting him. He lives three and a half miles out of London, in a pleasant and quiet suburban house; his son being established in Wellclose Square.

Boott I saw the same evening I arrived, and two days later, with J., but not later. He has been quite sick with an influenza, and a slight but not altogether pleasant inflammation of the lungs.

To Hooker I went at once also, and got your kind letter there, and saw Kew. Hooker is quite well; but Lady H. is very poorly. . . . She inquired most particularly and affectionately after yourself, and asked about all your family. . . .

[1] Peter Collinson, 1674–1768; a London woolen draper, and a correspondent of Bartram, who was the earliest native-born American botanist.

On Monday I made another visit to Kew Gardens, (a grand affair) to show the lions of the place to four or five young Americans I knew, one of them young Brace,[1] J.'s cousin, who is making with two friends a pleasant and profitable pedestrian excursion in England.[2] I cannot begin to tell you the half we have done and seen in England, but we were most busy: Saturday, conversazione of Royal Botanical Society in Regent's Park. Wednesday, excursion with Linnæan Club to Hertford; saw a great Pinetum, 600 species of Coniferæ, etc., and the Panshanger Oak. (I wrote Carey a few words of this.) Thursday, a most pleasant day with Hooker. Miss Hooker looks quite well; all send their love to you, all most kind and sweet to us. Hooker has altered little, but looks older. Brown looks older perhaps, but decidedly stronger, is as healthy as possible and very lively. In talking with him and showing him about it he gave up about Krameria, and said I must be right. He formerly unequivocally referred it to Polygalaceæ. Bennett is large and fat. I fear he does not work hard enough.

Yesterday we came down to Dover early in the afternoon (a striking place), and embarked late in the evening on steamer for Ostend, which we reached early this morning; came right on to Bruges, which listless and very curious old-world town, and its curiosities, we have all day been exploring, till six o'clock, when we came on twenty-eight miles further by railway to the famous and more lively town of Ghent, — where I have been running about till the dusk arrived,

[1] Charles Loring Brace, son of J. P. Brace. Eminent as founder of the Children's Aid Society, New York.

[2] The result was published in *Walks and Talks of an American Farmer in England*, written by his companion, Frederic Law Olmsted.

and must now to bed, as we have to finish Ghent tomorrow before dinner, and go on to Antwerp afterwards, thence to Cologne. I think we shall cut Brussels.

At Ghent saw the Belfry and the strange old Town Hall. . . . I went to the Botanic Garden (did not find Professor Kickx), — hardly as large as ours at Cambridge, and by no means so rich or half so well kept, though said to be the best in Belgium; explored the university library, and strolled through the streets and along the canals. . . .

Antwerp. — Imagine us settled comfortably at Hotel du Parc, Wednesday evening, overlooking the Place Verte, our windows commanding a near and most advantageous view of the finest cathedral in Belgium, with light enough still to see pretty well against the sky the graceful outlines and much of the light tracery and Gothic work of this gem of a steeple, one of the loftiest in the world (403 feet, 7 inches) and probably unsurpassed by any for lightness, grace, and the elaborateness of the carved work. Napoleon compared it to Mechlin lace. And such sweet chimes, every fifteen minutes! The chime at the beginning of the hour still rings in our ears. We have never tired of listening to it. . . .

Bonn, July 22.

We drove through the city (Cologne) to the station of the Bonn railroad. But on the way the driver, of his own motion, stopped at the door of the cathedral. Finding that we had time enough to take a good look before the train left, we could not resist, and saw this wonder and masterpiece of true Gothic architecture; which by the united efforts of most North German powers is going on toward completion, in the style and

plan on which it was commenced seven hundred or eight hundred years ago, and in which the choir was finished, and the transepts and nave commenced. It is most grand; the grandest thing we ever saw, though the nave bears only a temporary roof, at thirty or forty feet less than the full height. The ancient stained glass comes fully up to one's expectation. I have never seen the like.

We went up to Poppelsdorf; such charming and picturesque view of the Siebengebirge (seven mountains) and the Godesberg, etc., from the professor's windows and the Botanic Garden; the museums rich and curious, and parts of the old château in which they are (now surrendered to the university) not less so. The botanical professors, Treviranus [1] and Dr. Roemer, very kind; some collections to be made ready here for me to examine when we come back, so that I must then spend a day here. . . .

TO GEORGE ENGELMANN.

GENEVA, August 16, 1850.

We went up the Rhine to Coblenz, Bingen, and Mayence; thence to Frankfort. By some mistake in the post office in giving me the address, your letter to Dr. Fresenius [2] I took to a law-doctor Fresenius, who was away in Switzerland. So I gave up all hopes of seeing him, and we fell to seeing the sights by ourselves, when, a few hours before we had arranged to go to Heidelberg, the true Dr. Fresenius came in. We may see him again on our way back. We went to Heidelberg, for an hour or two only. . . .

[1] Ludolf Christian Treviranus, 1779–1864; professor of botany in Bonn.

[2] J. B. G. W. Fresenius, M. D., 1808–1866. Wrote many contributions to mycology.

It is now the 20th, — time passed fast. I work to-day in herbariums De Candolle and Boissier, and to-morrow morning we go to Freiburg and Berne and the Bernese Oberland. We cannot be back now in England so early as we expected; but still hope to be there by the 20th September. . . .

Thursday morning, after an early breakfast, went on by railroad to Kehl; left our luggage and took a carriage over the bridge of boats, across the lines of the French republic (?) into Strasburg. Saw Schimper;[1] then we went to the cathedral, viewed the grand front of this imposing structure, and the wonderful spire, the tallest in the world; were much struck with the grandeur of the interior, wholly lighted by stained glass, the greater part of it 400 or 500 years old. After visiting the Museum of Natural History, and arranging with Schimper to meet him in Switzerland, where he is to pass with his wife (a Swiss lady) a long vacation, we took our carriage and returned to the Baden side of the river, and came on to Freiburg (in the Breisgau) that evening, reaching it in the rain. . . .

Professor Braun,[2] the brother of the first Mrs. Agassiz, was very kind to us. He is a very interesting man, of charming manners; his wife very sweet and charming, his children most engaging. Saturday afternoon we took a carriage, and with Professor Braun rode up a beautiful valley to the Höllenthal (French, Vallée d'Enfer), a rocky and wooded gorge of

[1] William Philip Schimper, 1808–1880; an eminent bryologist and paleontologist.

[2] Alexander Braun, 1805–1877; a distinguished botanist, the early companion of Agassiz at Heidelberg; professor at Berlin. "As an investigator he stood in the front rank among the botanists of our time" [A. G.].

very striking scenery; wild and majestic, rather than terrible, as its name imports. . . .

In the afternoon visited the cathedral, one of the finest and oldest in Europe, that is well preserved. Here nearly every part, and all the stained glass, of a most curious kind, is perfectly preserved; and the spire, though not so high as that of Strasburg, is as elaborate and light, — as it were of woven stone thread, — and even more beautiful. . . .

Tuesday we rode from Bâle to Bienne (fifty-six miles) in a diligence, from eight A. M. to five P. M., through the Münster Thal, the grandest and most picturesque scenery of the Jura.

Wednesday, a ride of three hours along lakes of Bienne and Neuchâtel brought us to Neuchâtel at eleven o'clock A. M. . . . Professor Godet,[1] who received me most cordially, took me (with Mr. Coulon) up the Chaumont, 2,500 feet; but the Alps were obscured by clouds, at least the higher Alps, and we had no fine view of them; otherwise the view was very fine. We returned by the great boulder Pierre à Bot. All asked after Agassiz with much interest. Excursions are planned for us when we return. . . .

Dr. Gray enjoyed the visit to Geneva, where he renewed his friendship with MM. Alphonse De Candolle and Boissier, accomplishing some useful work, and having pleasant social meetings and excursions. He went to Chamouni and the Bernese Oberland; then to Munich, especially to meet again Martius, with whom he had been in constant correspondence, and who made the journey from Tyrol to greet his old friend. Their few days together were greatly enjoyed.

[1] Charles Henry Godet, 1797–1879; author of the *Flora of the Jura.*

He returned to England, going down the Neckar by steamboat to Heidelberg, then down the Rhine, and through Holland, where he saw Miquel [1] in Amsterdam, rambling with him on a fête-day through the streets at evening, enjoying the queer sights; went to Leyden, meeting De Vriese,[2] with whom was R. Brown (then staying in Leyden for a few days), and seeing the Botanic Garden, one of the oldest in Europe, and well known to Linnæus. Blume [3] he missed, but he saw Siebold's [4] collection of Japanese curios, then most rare. He took steamer from Rotterdam to London, and after a few days went down to Mr. Bentham's, in Herefordshire.

Here were spent two months of very hard work with Mr. Bentham, who most kindly went over with him the plants of the United States Exploring Expedition, which had been brought over the Atlantic for the purpose.

Pontrilas is in a pretty, hilly country on the border of Wales, with many old churches, almost of Saxon time, in the neighborhood, to give interest to walks, and very interesting, agreeable neighbors for a day or two's visiting, among them the authoress, Mrs. Archer Clive, who was very kind.

He left Pontrilas early in December to make a visit, at Dublin, to his friend Professor Harvey, to stay in

[1] F. A. W. Miquel, 1812–1871; director of the Amsterdam herbarium and professor of botany, Utrecht.

[2] William H. De Vriese, 1806–1862; professor in the University of Leyden; author of many important works and memoirs.

[3] Charles Louis Blume, 1796–1866; in charge of the Colonial Botanic Gardens at Java; later curator of the herbarium of the Royal Museum at Leyden.

[4] Philip Franz Siebold, 1796–1866. Wrote *Flora Japonica.* He brought from Japan a large collection of curios when the country was rarely opened to a foreigner, and at the risk of his life.

the family of Mr. and Mrs. Todhunter, Dr. Harvey's sister. Going on board the steamer at ten in the evening, he met with the severe accident of which he gives an account in his letters. Dr. Harvey came from Dublin to help in nursing him. His vigor and elasticity helped him to a speedy recovery, but it increased a general tendency to stoop, and he was never so erect afterwards.

He was able to get to Kew the last of December, and spent the winter in hard work in Sir William Hooker's herbarium, which was then in his house at West Park.

TO A. DE CANDOLLE.

CUMBERLAND PLACE, KEW, December 28, 1850.

Your kind favor of December 6th, forwarded to me by Bentham, to Dublin, would have been sooner acknowledged, but that it found me an invalid. On our way from Hereford to Dublin I had just gone on board a steamer at Holyhead, early in the evening; had left Mrs. Gray in the ladies' cabin, when, coming on deck again, I stepped over an open hatchway which had been left for the moment very carelessly unguarded and unlighted. I fell full eighteen feet, they say, to the bottom of the hold, striking partly on my right hand and the side of my right leg, bruising and straining both, but principally on my right side against a timber projecting from the floor, fracturing two of my ribs. It is truly wonderful that I was not more seriously and permanently injured. I was taken on shore at once and had good medical attendance. I recovered so rapidly that in a week I was comfortably taken across to Dublin, where I was kindly cared for by good friends; in two weeks more I left for London,

able to walk without difficulty; and to-day, just four weeks after the accident, I have begun to work at plants again, in Sir William Hooker's herbarium. But my side is still tender, and my strength is not great.

Having said thus much of my bodily condition, let me no longer delay to thank you heartily for the very unexpected compliment that you have caused to be paid me, and to ask you to convey, in fitting terms, my grateful acknowledgments to the Société de Physique et d'Histoire Naturelle, for the honor they have conferred upon me in choosing me as one of their corresponding members. I was not aware that I had rendered any particular services to your society, but I shall be very glad to do so if any opportunity offers. Although, generally, I am far from coveting compliments of this kind, I assure you I am much pleased to be thus associated with several valued personal friends, my contemporaries, and with such highly honored names of the past generation. . . .

We had eight weeks of most pleasant and profitable labor at Pontrilas, and Mr. Bentham has rendered me invaluable assistance.

Mrs. Gray joins me in the expression of kind remembrances and regard to Madame De Candolle and yourself.

Believe me to remain, ever most sincerely yours,

ASA GRAY.

Since Dr. Gray was so near Sir William, and working in the herbarium almost every day, there was much meeting of old friends, and of many of the men distinguished in botany. Robert Brown, with his keen observation and dry wit, he saw constantly at the British

Museum, Dr. Wallich,[1] Mr. Miers and many others. There was some social visiting in London and the neighborhood. Mr. Abbott Lawrence was then American minister in London, and he and Mrs. Lawrence were very kind and attentive, giving him a chance to see at an evening reception some of the great men of the London world: the Duke of Wellington, Lady Morgan, Whewell the Master of Trinity, Lord Boughton, Lord Gough, and many others.

It was the year of the first great World's Exhibition, and the building was then considered very wonderful. Through the kindness of Professor Lindley he was enabled to see it before it was completed.

There was a very charming visit to Oxford in March, where Dr. Gray made most delightful acquaintances. He there first met Dean Church, then a fellow of Oriel, who had him to dine. He also dined with Mr. Congreve[2] at Wadham; met Maskeleyne, who showed him "some fine talbotypes, which are a sort of daguerreotype on paper, and have a beautiful effect for landscapes and buildings." Breakfasted with Mr. Burgon and Mr. Church, at Oriel, in Dr. Pusey's old rooms, and met Mr. Burgon again at dinner, when dining in the "Common Room," at a dinner given him by Mr. Church, and also Buckle and Sclater. Dr. Jacobson, then Regius professor of divinity, afterwards Bishop of Chester, and Mrs. Jacobson, were very kind. Dr. Daubeny was then professor of botany at Oxford, and there were some plants to look at in the small herbarium kept in the

[1] Nathaniel Wallich, 1789–1854, a Dane by birth; a distinguished East Indian botanist.

[2] Richard Congreve, fellow and tutor of Wadham. Among his many publications is *The Translation of the Catechism of Positive Religion.*

little Botanic Garden in an old greenhouse. The days were crowded with interesting sight-seeing and in meeting agreeable people.

From Oxford, Dr. Gray went to Cambridge, where he met again a traveling acquaintance made on the passage from Rotterdam, Dr. Thompson, then Greek tutor, later Master of Trinity, who was very kind in doing the honors of Trinity, King's Chapel, etc. At his rooms, Dr. Gray met Professor Challis and other Cambridge men. The grounds about the colleges were then at their greatest beauty, the banks of the Cam yellow with primroses, the whole setting off the beautiful bridges and stately buildings. Another traveling acquaintance met in the street, recalling an experience on the Furca, asked Dr. Gray to dine with him at Caius College, saying his name was Mackenzie. He was Bishop Mackenzie, who died in south Africa.

On returning to Kew, Dr. Gray found Dr. Joseph Hooker, just back from his journey to the Himalayas and Thibet. Dr. Thompson [1] was also there, just home from India, where he had been imprisoned with Lady Sale and others, twenty of them in one small room, during the trouble in Afghanistan. And one day came an invitation to lunch from the Hookers', "to meet Mr. Darwin, who is coming to meet Dr. Hooker; is distinguished as a naturalist." "Mr. Darwin was a lively, agreeable person" [Mrs. Gray's journal].

TO A. DE CANDOLLE.

5 CUMBERLAND PLACE, KEW, April 14, 1851.

For myself I am glad that I am perfectly recovered from the effects of my accident, and am as active as

[1] Thomas Thompson, 1817–1878; son of the distinguished chemist of Glasgow; explorer and traveler in India; director of the Calcutta Botanic Garden.

ever. I have passed a very pleasant winter, and have prosecuted my studies to great advantage, though there still remains, alas! more for me to do than I can hope to accomplish in the time that is still left for me. Your letter was just in time to reach me here; for we had just decided to go to Paris early next week; to remain there until the 1st of June, at least. The only drawback is that we thereby lose the society of Mr. and Mrs. Bentham, who mean to come to London early next month. . . .

Sir William Hooker is not yet well, though better than he was last winter. I have presented your kind messages, for which he sends best thanks, and is rejoiced to hear of your recovery. Sir William is truly a noble man; the more intimately you know him the more strongly attached to him you become. . . .

I had thought it quite likely that we might pass through Geneva again this summer; but that is not now possible. The sea, however, is not so broad as formerly. Believe me to remain,

Very faithfully and affectionately yours,

ASA GRAY.

In April Dr. and Mrs. Gray went to Paris, where he worked busily through the mornings at the Jardin des Plantes, taking the afternoon for his sight-seeing. He met again his old friends, Jussieu, Decaisne, Gay, etc., and made the acquaintance of M. and Mme. Vilmorin, both most charming and interesting people; the former distinguished as a horticulturist, and both making investigations for many years on the varieties of strawberries, for which Mme. V. made all the drawings. Two separate days were passed at Verrières, their country home, an old villa belonging formerly

to the Duchesse de la Vallière. And here to meet him came old Michaux [1] the younger, then eighty-one, who had walked from his home (fifteen leagues), for the pleasure of seeing Dr. Gray. And it was at Dr. Gray's request that both Michaux and Jussieu sat for their daguerreotypes for him, the only satisfactory likenesses of either. Mr. François Delessert [2] extended pleasant hospitalities, and Mr. Webb was very kind and cordial.

It was during the time of the Republic, Louis Napoleon, president, and there were some grand fêtes in May, in honor of the Republic, at which the officers of the government were conspicuously absent.

Dr. Gray returned to Kew in June to continue his work, broken only by some days in London.

TO GEORGE BENTHAM.

PARIS, April 30, 1851.

DEAR BENTHAM, — I cannot give your message to Weddell, for he is on his way to the Peruvian cinchona forests, to remain a year, — I suppose on a commission from the manufacturers of quinine. Jussieu still suffers with some affection of the stomach, but is much better than last winter. Decaisne is quite well, but is occupied with the *Culture*, and is little in the herbarium, where Spach, Tulasne,[3] Naudin,[4] and Trécul [5] are in charge, under Brongniart and Jussieu.

[1] François André Michaux, 1770–1856; son of André Michaux, who traveled in North America from 1785 to 1796. Wrote *Forest Trees of North America*.

[2] François Delessert, brother of Benjamin. Died 1868. Liberal patron of arts and sciences.

[3] Louis René Tulasne, 1815; aide naturaliste at the Museum at Paris.

[4] Charles Naudin; now director of the Jardin d'Acclimitation at Antibes.

[5] Auguste Trécul, Paris; writer on Vegetable Histology.

Webb is well, and so is Gay, who is quite happy, living on his half pay, which the Republic has secured to him, with his rooms free of rent, and some savings from his former income. I have not seen Gaudichaud yet; but he has offered to come and show me his Sandwich Island collections, etc., of which he has issued some plates, in "La Voyage de la Bonite," but no text has appeared, and none seems likely to appear.

I gave to Dr. Alexander the list and notes on Fendler's Chagres plants. He will hand it to you when he sees you in London.

TO GEORGE ENGELMANN.

PARIS, May 6, 1851.

Robert Brown told me that Link would be succeeded in his excellent and lucrative professorship either by Grisebach [1] or by our excellent friend Braun. Since I have been here, a young man from Berlin says that the choice has fallen on Braun, — to my great joy, for I love Braun very much. I have given Lowell, who leaves Paris to-day, and will be in Germany in June and July, a letter to Braun, addressed to Giessen or Berlin.

Prince Paul's sensitive branches of Mimosa catching unwary travelers is rich!

TO ——.

Wednesday morning, June 11.

Settled down to usual Kew routine; glad enough to get back to quiet and superlative neatness; to less

[1] Heinrich Rudolph August Grisebach, 1813–1879. Hannover and Göttingen. Professor of botany in the university. "A prominent and voluminous systematic botanist. His most important work a treatise on the Vegetation of the Earth" [A. G.].

elegance than our Parisian quarters, but decidedly more comfort. The only thing that distresses us is, that we cannot translate dear Mrs. Crook bodily to Cambridge, Massachusetts. Sure we would if she were younger; but the dear old creature will now erelong be translated to a far better land. . . . Unpacked (which in interminableness is only second to packing up) and went down to the Hookers'. . . .

Friday, after writing and dispatching letters home, we went up to London, shopped, etc., in the City; streets nasty (the English word is very appropriate; no wonder they always use it), and such a contrast to beautiful and gay Paris, which is vastly more convenient and agreeable for shopping. . . .

Saturday, . . . a little stroll in the Gardens, which are looking beautifully, the trees loaded with rich foliage, and the great masses of Rhododendrons in blossom.

In the evening went with Dr. Hooker up to the last soirée of Lord Rosse, the president of the Royal Society; too late to see Prince Albert, who came and went early; saw the usual dons. Sir Charles Lyell asked if I had stayed abroad all the time since last year, or had just come over afresh! . . .

Wednesday, we were off early in the morning, to make our first visit to the Great Exhibition. We went up to town by railroad as usual; walked over Waterloo bridge, and having reached the Strand, had the satisfaction of seeing nine omnibuses pass westward, all full. Despairing of all hope of getting into an omnibus, we were just turning to look for a cab, when a well-dressed and respectable woman, who had been making similar unsuccessful attempts, rushed up to us, exclaiming, "Oh! are you going to the Exhibition?

Will you not take a cab with me? I have been trying for an omnibus in vain this half hour, and I have made an appointment with some friends there at half past ten." We agreed at once to this reasonable and very convenient proposition, and we shared the expense accordingly, with many expressions of thanks on the lady's part. Before we had reached within half a mile of the Crystal Palace we were obliged to fall into dense line, with a close double file of cabs, carriages, dog-carts, and other "vehicular conveyances," all wending their way thither, a similar file of empty carriages returning on the other side of the street; the sidewalks as well as the roads inside the park all crowded with pedestrians. Early as we were, a vast number of people were already there, but scattered through the vast interior, they scarcely made a crowd, until midday, when the more attractive parts of the structure, the principal streets and squares, so to say, were thronged.

As to what we saw, is it not written at length in the great Official Catalogue (as far as that ponderous document is yet published), besides the Abridged Catalogue, in itself quite a sizable book, which we mean to bring home, with the Synopsis, and other things, quite a library, and I dare say you have heard and read quite enough about it. I doubt whether you have seen the excellent and spirited articles in the "Times," beginning long before the building was finished, which give a most admirable and lively account of everything.

The general impression of the interior was not quite so imposing, did not give such an idea of the vastness, as when we saw it in April, less full, and the long spaces unbroken.

On our way down the nave, we stopped for a moment to see the Koh-i-noor, but the Mountain of Light looked to us little brighter than a piece of cut-glass. It does not come up to the general expectation. Manage it as they will, it does not shine at all wonderfully, and the people got it into their heads that the authorities were shamming them with a glass imitation instead of the veritable Koh-i-noor; an idea well expressed in "Punch," who called it "the knave of diamonds." We determined to show our patriotism by going first of all carefully through the American department, and quite a trial to one's patriotism it is, a great space, very scantily filled with an ill-assorted, incongruous collection (although they have given up to Russia and France about one quarter of the space that Mr. Lawrence asked for and insisted upon having): one long shelf displayed only half a dozen wooden pails; another side was decorated with a miserable collection of cast-off specimens of autumn-leaves, and below with a case containing five or six dozen bottles of prepared magnesia, all just alike, flanked at the sides with a similar collection of Old Jacob Townsend's Sarsaparilla, surmounted by a portrait of the illustrious inventor. The strength of the nation has gone to daguerreotypes, of which there are about two thousand very good specimens of the art, it must be said, far better than they can produce in England. The same may be said of many things, creditable in themselves, but of which they have filled up their space, or attempted to fill it, with an enormous number of specimens, where one or two would suffice. But wherever anything is quite poor and commonplace, the exhibitor is sure to make it up in brag, in which it must be confessed we do "beat all creation."

Monday we went to the Zoölogical Gardens, very extensive, in fine keeping, the richest collection of living animals of all sorts in the world. Were very much amused with monkeys of all sorts and sizes, from those little larger than a rat to the great and sedate orang-outang,[1] just arrived, who is quite a human and a very respectable grave old fellow. We saw the hippopotamus, too, but he lay sleeping in the sun, and would give no sign of life except occasionally opening his eye and giving a wink. But one of the most amusing sights was the little suckling elephant, with its mother, and it was curious to see the little thing use its trunk as perfectly and knowingly as its mother. . . . We stayed to see the ferocious animals fed, at half past four, no great sight, as they behaved extremely proper, and then we hurried back to the station and came home to Kew.

A short visit to the British Museum, which is an immense collection of objects of natural history, sculpture, books, antiquities, etc., etc. Had some botanical work in the herbarium there (the British Museum), but did not do anything that day, for we spent the time talking to Mr. Brown, who was in quite a chatty mood. He is a singular-looking man, with a very heavy lower lip and jaw, and generally carries his head down; but it is curious to watch him, and see how he kindles up, and what a satirical twinkle comes in the corner of his eyes when he tells some story, for he has a good deal of satire.

Dr. Gray went to the meeting of the British Association at Ipswich, where Prince Albert came for a few days. Dr. Hooker and Dr. Harvey (who had

[1] Died 1892, much lamented.

been making a visit at Kew), and other scientific friends, were there. Among other discussions in one of the sections was one on the possibility of a railroad to the Pacific, a paper by Asa Whitney, "which had been brought before the Geographical Society in London, and reported on favorably."

From Ipswich he made a most interesting visit to Lady Hooker's father, Dawson Turner, seeing his very valuable collections, autographs, pictures, etc., and returning to Kew to work until breaking up to go back to America. A short trip was made in Ireland, and Dr. Gray went to Pontrilas to say good-by to Mr. and Mrs. Bentham, immediately before the voyage. Dr. and Mrs. Gray were again at home, September 4.

After Dr. Gray's return from Europe, his busy life went on, filled with college work and the care of the Garden as accompaniments to a study of the new collections constantly coming in, the work on the Exploring Expedition, the keeping his various botanical text-books in their new editions up with the advancing science, and his always large correspondence. His letters were chiefly on the questions upon which he was working, but with many touches on events of interest of the day, and little playful turns. He says in a letter to Dr. Engelmann, "I well know I have too many irons in the fire."

Unfortunately, Mr. Darwin destroyed all the letters he received before 1862, except the one published in his "Life and Letters," which is inserted later, as well as one to Sir Joseph Hooker taken from the same volume. The rest of those to Sir Joseph are mostly bound up in the botanical correspondence at Kew.

Dr. Gray was an immense worker. After his morning mail was received and looked over, that he might answer any imperative questions, he took daylight for his scientific work, and, with pauses for meals, and the necessary interruptions that came at times, he kept steadily on all the day. He wrote his letters and his elementary botanical works mostly in the evening. But in his younger days his eyes were unusually strong, and he would work with the microscope by lamp-light as readily as by daylight.

Though a steady and unwearying worker he was not rapid. He would throw aside sheet after sheet to be rewritten, especially if there was anything he wished to make particularly clear and strong, or any reasoning to be worked out from the soundest point of view. It was always a wonder to those about him that he could stand as he did the unceasing labor, but he was a sound sleeper even if the hours might be short, and of a vigorous, wiry, active temperament, and when he did take a holiday, he took it heartily. His rest and recreation were in journeys, longer or shorter, and every two or three years some long outing would be taken, to give him the needed refreshment. But he must always be busy even then, somewhere to go, something to see; rest in quiet seemed impossible to him for more than a day at a time.

TO CHARLES WRIGHT.

CAMBRIDGE, January 23, 1852.

I am printing on "Plantæ Wrightianæ," the first part of which (as I work in so much general matter, especially Tex-Mexican), to the end of Compositæ, will

take 225 pages or more, with ten plates, — the most important memoir I ever wrote, and will indelibly fix our name on the Texan-New-Mexican Flora. . . .

I have just found a letter of Sullivant's, dated May 27, 1850, in which he says, "Send me by all means Wright's Texan Mosses and Hepaticæ." . . .

Poor fellow! as I wrote you before, he lost his wife while I was away, and was overwhelmed, as she was everything to him, and as good a muscologist almost as he. . . .

You are in a fine field. Hold on and keep a good heart. I long to see what Colonel Graham is now bringing on to me. . . .

June 5.

There, my dear Wright, I consider myself very much of a gentleman! For your favor of the 12th April reached me only this afternoon, and now before the sun has gone down I am answering it! Your letter came very opportunely too. For, though Colonel Graham has been back so long, it was only yesterday that I got the collection he brought home with him to Indianola (and the seeds); and to-day I opened it and had looked over only two bundles. And I was saying to myself, Now if I only had Mr. Wright's list with localities, I should do very well. And when my letters came from the office, yours, with said list inclosed, was among them. The plants look well, but I have only peeped into them yet. I am glad if you have found Amoreuxia malvafolia, but I have not yet hit upon it. . . .

I am still very busy with college work, for a month longer, and with the Garden; and the Exploring Expedition work has been pressing me, and still will.

But I shall somehow distribute your 1851 collection very soon, name them up to the end of Compositæ, and in the course of the summer determine many of the monopetalous families. I have already named and described a few of these and some Apetalæ to please Colonel Graham, and named a new Pentstemon after him (which I have growing, too), which compliment seems to gratify him.

By this time you will have received the index and plates of "Plantæ Wrightianæ." Copies are already in England, and I am about to dispatch many to France, Germany, etc.

You are indeed an invaluable collector, though you do like to grumble now and then, and I hope the Indians won't catch you. If they must take a scalp or a head, there are others I could better spare. So take care of yourself. . . .

TO GEORGE ENGELMANN.

February 23, 1852.

I carefully keep your flowering bit of Fendlera, ready to return it if Lindheimer does not get more, as I trust he will. It is the most interesting of North American genera, between Deutzia and Philadelphus, and shows plainly that both are saxifragaceous. . . .

July 28.

I am worked almost to distraction. But college work is now over and I can get on with fewer irons in the fire.

I fear you are driven up hard also, by the sickly season and cholera. I hope you may be able to give up practice by and by. . . .

I have had for a good while a misunderstanding with

Captain Wilkes about my work for the Exploring Expedition botany. It is now made up, I think, or nearly, but I have had no pay from them for a long time, and they are a year behind in paying. I have got manuscript of several families all ready for the press, and some fine drawings. I am just now working up "Plantæ Wrightianæ," 1851 collection, up to end of Compositæ, old stopping-place, but must dash beyond that soon. . . .

TO W. J. HOOKER.

CAMBRIDGE, December 4, 1852.

Here is a discovery! I have to-day received by post from Dr. J. F. Beaumont, of Mountain Home, in the upper part of Alabama, specimens of a Trichomanes, which he finds growing there under shelving rocks. I send you herewith the half of what is sent me, knowing you will be much interested in the discovery, for the first time, of a Trichomanes in the United States; and thinking that you will probably pronounce it to be a form of the T. radicans, though so much smaller than my Irish and West Indian specimens. . . . I have not specimens enough of T. radicans to satisfy myself entirely, and refer the question to your experienced judgment. Pray give me your opinion, for the addition of a single species to our few ferns, and especially one of this group, is a matter of moment to us, and worthy of a published notice.

I should not be so greatly surprised now if Hymenophyllum ciliatum, credited by Willdenow to Virginia, should turn up, but I still think there was some mistake about that; and I could find no specimen in Willdenow's herbarium when I sought for it, in 1839. . . .

Next Wednesday's steamer, which takes this letter, will also take, for a short European tour, my good father-in-law, Mr. Loring, with Mrs. Loring, and Mrs. Gray's brother Charles. A rather sudden determination, but we have strongly urged the journey ever since the death of their dear little boy, the little Benjamin, who seemed given to be the comfort and stay of their declining years, who was born just before our return home, a year ago last summer. The rest and change are needful to Mr. Loring, also, from being worn down by his long-continued labors at the bar, of which he is perhaps the leader in Boston; I am confident it will be of great benefit to him; and the Old World has much to interest a man of his refined taste. . . . And then Kew Garden is to them one of the wonders of the world, as well as a place with which they have, through us, so many pleasant associations. Should you wish them to enjoy the privilege of seeing the Gardens under your own kind auspices, would you notify Mr. Loring through Boott (for I do not now know what will be their London address), of a day that would be agreeable and convenient to yourself. . . .

January 4, 1853.

Wright will now soon be off in Ringgold's North Pacific Surveying Expedition, to explore Behring Straits, Kurile Islands, the coast of Japan, if possible, and to winter at the Sandwich Islands.

So we shall have no more New Mexican plants from him.

My new memoir, "Plantæ Wrightianæ," is now almost all printed, and contains many novelties. I never had a collection so rich in entirely new things.

I long to hear what you will say of the Trichomanes from Alabama which I sent you.

With best wishes for the new year to you and all yours, I remain, Yours affectionately,

ASA GRAY.

January 28, 1853.

"It never rains but it pours" is an old adage suitable to this meridian and illustrated by what I now send you, namely, a second Trichomanes from Alabama! discovered by the indefatigable Thomas M. Peters, Esq., of Moulton, who (and not Mr. Beaumont, it appears) was the first finder of Trichomanes radicans in Alabama.

This one seems to me clearly a new one. . . .

I think it particularly appropriate in this case that it should bear the name of its discoverer, so I have called it Trichomanes Petersii, and have sent a little article on it and Trichomanes radicans to "Silliman's Journal." . . .

In 1853 began Dr. Gray's long correspondence with the Dean of St. Paul's, — a friendship whose intimacy was ever increasing and which lasted through his life.

TO R. W. CHURCH.

February 7, 1853.

MY DEAR MR. CHURCH, — Since I heard, which I did first from Mr. Clough,[1] that you were about to marry and take charge of a parish, I have been longing every time I wrote to England to add a line expressing my most sincere congratulations. I hope you

[1] Arthur Hugh Clough, 1819–1861. The poet was resident in America from November, 1852, to June, 1853.

will not think me too presuming if I make bold to do so, and if I ask you where your parish is, for I would gladly form some idea of where your home is to be. Pleasant and desirable on many accounts as an Oxford life must be, yet I cannot but think you more appropriately placed in the pleasant parsonage I can fancy, the centre of a little world of your own, and the spiritual guide of an attached body of parishioners, where you will be very happy and very useful.

Still let us hope that the visit to Cambridge, New England, is only deferred, to afford us a double gratification. I think you can sometimes leave your parish for three months, or even more with special leave, and the voyage is becoming shorter and cheaper every year.

I have looked through the "Times," which I see regularly through the kindness of a friend, thinking that I might perchance see your appointment, presentation, or whatever it may be, mentioned; but in vain.

By the way, I am glad to see that you have elected Mr. Gladstone. Your name on the Oxford Committee makes me suppose you have not yet left Oxford.

Dr. Albro has returned in restored health, and speaks with much gratification of his visit to Oxford, only regretting that your absence prevented his making your acquaintance until the last moment of his short stay.

Mr. Clough brought me a letter from Maskelyne of Wadham College. Circumstances, I am sorry to say, have yet prevented me from seeing him here as much as I could wish. I hope soon to know him better. He has excellent and influential acquaintances; but one hardly sees what he is to do.

If he holds Unitarian views, as I have been told, he will perhaps be more favorably situated, just in Boston or Cambridge, than in England, and probably meet more cultivated and more religious people of that persuasion than at home. But if he sympathizes rather with Francis Newman and that school, as some one tells me, I should think he would not find that class of people here very attractive to him. But I hope that is not his bent. I have no partiality for Unitarianism, though it is the faith of near and valued friends. I am an orthodox Presbyterian, as my fathers were. But in England I should be a Churchman, although a pretty low one, at least in some respects; and I am a most hearty well-wisher to the Church of England. So pray, when settled in your parish, just drop me a line to say where you are, and how old your parish church is; for hankering after antiquities is, as an Oxford man told me, a great failing of Americans.

TO A. DE CANDOLLE.

CAMBRIDGE, March 28, 1853.

MY DEAR FRIEND, — I am all the more glad that I can direct your attention to the fourth volume (new series) of the "Memoirs of the American Academy of Arts and Sciences," p. 382, where you will find your name enrolled as the sole Honorary Member for Switzerland.

Ordinarily neither you nor I would be at all solicitous for such recognition. I care not to have them except where (as in the Linnæan Society of London, the French Academy, and your own society of Geneva) I well know the nominations are strictly and conscientiously weighed, and where the list to be

filled is a limited one. But we here prize the name of De Candolle so highly that we count it a privilege to have it on our foreign list. . . .

I should state that this academy, the oldest but one in America, was in a state of inactivity and hebetude since the death of its former president, Bowditch, till 1843, the year after I came to Cambridge, when it was determined, chiefly by some of my colleagues in Cambridge, to restore it to life and vigor. It is now full of life. The number of its foreign members is now limited to seventy-five, and they are chosen by a very formal process and a very rigid scrutiny, so as to have only the very best names in the several departments of knowledge. Formerly they were chosen without such care; so that there are names on the list that could not be placed there now. Hereafter the list will be a most select one. . . .

Hereafter we will send our parcels through the Smithsonian Institution and through its agent, Mr. Hector Bossange, Paris. You justly praise the publications of this institution. It is on the point of issuing another splendid volume; and at least one a year will continue to be issued.[1]

Liberal in its distribution, the Smithsonian Institution looks to its exchanges as a means of building up a library valuable for scientific researches in this country. You may remember that, when at Geneva, I ventured to ask you to recommend to the Société de Physique et d'Histoire Naturelle de Genève, to vote its series of memoirs to the Smithsonian Institution.

[1] It also often has the distribution of a certain number of public documents of scientific value. I am about to ask its secretary to procure for you, if possible, a copy of Frémont's two reports, which you desire, — if too late to procure it gratis, as I fear, to purchase the volume at my expense. — A. G.

But you thought it would not then be quite proper to request it. Now that the institution has given such evidences of its vigor and productiveness, and that I can assure you it is only beginning to do its work, and that in number of volumes it will soon overtake you, I venture to renew the request which I was then requested to make; and I think that your society, with these assurances, and in view of the good offices of the Smithsonian in promoting interchanges (at no small expense), would freely accord the earlier volumes of its memoirs, on your proposition. . . .

Dr. Harris [1] has made interesting researches on the plants cultivated by our aborigines, which I urge him to publish; but he is one of those persons who are never quite ready to print as long as they live.

I have long suspected that Helianthus tuberosus came from North America. I should like to study from what indigenous species it comes. . . .

As to the "Botany of the South Sea Exploring Expedition," the manuscript and the drawings are ready up nearly to the Leguminosæ; and the printing, which is not under my control, is about to commence. The work will probably make three quarto volumes and 300 folio plates. I shall be sure to have a copy to send you. As to the specimens, there are few duplicates; and of these I am not myself allowed to retain any. Possibly, hereafter, some may be awarded to me. That expedition did not land on the high Antarctic coasts it saw, and therefore made no collections there. Its Antarctic collection is all from Orange Harbor, Tierra del Fuego, and has little that is new.

The most interesting part of the collection was made at the Sandwich and Feejee islands.

[1] Thaddeus Wm. Harris, 1795–1856; librarian of Harvard College and a distinguished entomologist.

My wife and I well remember what a charming place Vallon is, and retain pleasant memories of our trip to the Salève under the charge of Madame De Candolle, despite the bad weather which spoiled the view. We should delight to revisit Switzerland. Having no children, it is not impossible that we may do so; but the time, I fear, is far in the future. . . .

I have written a much longer letter than I had intended when I began.

Believe me to remain, yours very faithfully,

ASA GRAY.

TO GEORGE ENGELMANN.

CAMBRIDGE, July 14, 1853.

MY DEAR ENGELMANN, — This cover has been addressed to you for a long while, but I have delayed to fill and close it, not so much because you had not written, for I knew you must be very busy now, but because the convenient time has not exactly come. For I have been very busy. College work done up only last week; printing of "Exploring Expedition Botany," in which I have read proofs up to 220 pages, and gave to-night finished manuscript (except a few crooked points to settle in a family or two) up to the end of Rosaceæ (which will make about 450 pages. It fills up fast with the open pages adopted in these reports). I shall carry on the volume to 550 or 650 pages, and the plates folio, already 56, shall carry up to 100, if I can. There is next some tough work in Myrtaceæ and Melastomaceæ; but as to the latter Naudin has much cleared the way. Those done, and I think I may venture to work part of the time on the Lindheimer, Fendler, and Wright Monopetalæ.

Agassiz returned most delighted with his visit to you, and we talked much of you. . . .

I am afraid to touch Gregg's Mexican plants, for fear of the time they would consume. In "Exploring Expedition," I branch out little or none, except a few notes in Malvaceæ, and probably more in Compositæ.

If I could do the work abroad, I could work up collateral things most advantageously; but the means here at disposal are too poor.

Still, you will be pleased with my volume i. when I finish and send it to you (the letterpress this fall!).

No specimens scarcely of Cactaceæ in collection Exploring Expedition, — a drawing or two. I shall send them on to you presently. . . .

I grieve to tell you that Adrien de Jussieu is dead. Cancer in the stomach, his tedious malady proves to have been. It makes a deep impression on the scientific men, and the public, too, in Paris. He was much my most intimate correspondent in France, a true friend, and a charming man.

You know, perhaps, that Moquin-Tandon has succeeded the late Achille Richard at L'Ecole de Médecine. Tulasne, I suppose, will be the new professor at the Jardin des Plantes; at least he ought to be, as he is the most able man.

No farther news since my last.

Agassiz looks poorly and says he is not well. . . .

I never could get Fouquiera up. To-day I have sown some seeds, and put on my own table, by the window, to watch. . . .

18th August.

Agassiz handed me your note about the Compass plant. I took him at once into the Garden, to see Silphium laciniatum, terebinthinaceum, and pinnatifidum.

He agreed there was no direction to be made out,

one way more than another. The cauline leaves all tend to become vertical (as in several other Compositæ), but present neither face nor edge north.

But three years ago Lapham of Wisconsin wrote me that, though the plant near Milwaukee showed no "polarity" (and so he never believed in it), yet on going farther west, on the prairies, he found it did generally turn all to the north there.

If I remember aright, though, he said the surfaces of the leaf look north and south. You say the edges? How is this? Compare notes with Lapham. . . .

What do you think I am about now? Revising genera of Myrtaceæ for Exploring Expedition collection.

In these exotic orders I frequently find the genera so at loose ends that I cannot make the plants of our collection lie comfortably till I have given the genera a good shaking up. I should be tempted to do much more of this if I could work at Hooker's, or in Paris. It is quite as well not, as it would cost no end of time. . . .

I have found some Fouquiera seedlings up in the Garden. I am right about it; not Torrey. The leaf is not axillary and its petiole inclosed in the spine; but the spine is a hardened inferior portion of the petiole that persists, and from which the rest falls away clean. . . .

TO W. J. HOOKER.

CAMBRIDGE, August 3, 1853.

MY DEAR SIR WILLIAM, — I will endeavor to get some account of Shakerdom for you. They are a queer people indeed.

Manilla paper [1] is made of old manilla rope, which

[1] Dr. Gray sent to Kew manilla paper for the genus covers in the herbarium.

is largely used by our shipping. But what plant yields the manilla hemp for this cordage I have not the means of knowing, that is, whether the Musa textilis or no. I have been promised specimens of the stem of the plant, etc. But the climate makes our countrymen indolent there, and forgetful. I will ask for statistics as to the paper manufacture. . . .

I shall be pleased to have you figure as many of our ferns as you can; and pray give names to all new species without hesitation. They will be more fitly named by the describer than by any one else.

I note with satisfaction what you write about genera of ferns. This pushing a single character (as venation) without regard to consequences, and giving it the same importance when it does not accord with habit as when it does, is the fault of most botanologists who restrict their view to one subject or one idea only. I am glad that you will carefully revise the genera on your own judgment.

By the way, the fern I sent you last spring, and which you called Asplenium montanum, Willd. (a species I used to know well), struck the collector (Beaumont), as it did me, to be different. Pray collate, and perhaps figure it, as well as the ordinary A. montanum.

I was grieved to hear of the death of Adr. de Jussieu, with whom I have had a very pleasant correspondence for the last three years, and to whom I was attached as to no other Frenchman. His late letters were so cheerful and lively, and even hopeful, that the news of his death took me by surprise, notwithstanding the steady failure of his health for a long while. . . .

We remember with interest that dear Harvey sets out to-morrow on his long voyage.

TO R. W. CHURCH.

Christmas Eve, 1853.

MY DEAR MR. CHURCH, — It is a good time to remember old friends and to bring up, as well as one may, arrears of neglected duty. I have long unaccountably neglected to acknowledge your letter of the 24th August, and to thank you most heartily for the interesting volume of your collected reviews, which reached me a little earlier (I know not how it was so long delayed between New York and Cambridge), and which I have received and read with much pleasure, that is, all I have yet read. For I am saving the article on Dante for my first leisure hour. The first I read was the article on Pascal and Ultramontanism, of which I greatly admire the delicate and thorough handling.

I wish I could send you something of any interest. But I am not well enough satisfied with the elementary work which I use as a text-book for my lower classes to offer it; and besides that I have published, since last in England, only memoirs of the botany of our new western regions, one volume of the botany of a Government South Sea Expedition, etc., all dreadfully dry and technical.

I have been unusually busy this year, and am just now especially so, having to complete the preparation of nine lectures on Vegetation, which I am to give before the Smithsonian Institution at Washington next month.

I do not much fancy popular lecturing, and do this only to please a very valued friend, Professor Henry, the secretary of this institution. This over, I shall return to my regular plodding work at home, with great satisfaction.

I do not wonder that you feel a little nervous about the result of the experiment at Oxford. I can well understand it, and if I were an Oxford man, which I should count it a high honor to have been, I should share the feeling. I count it an excellent thing that the new enactments were framed by friendly hands, and are not very sweeping. As far as I can judge from the election of the present council, those of the Movement party by no means have it all their own way.

It seems to me that the admission of Dissenters to the A. B. degree is a wise measure, and one that will do no harm to the university nor the church. But I see not how they can go further. It would not be right that they should pass to the A. M. and share in the government of the university.

Any position at Oxford or Cambridge which allows of matrimony must be a desirable one for a person of scholarly pursuits. I can hardly think you will pass your life at Whatley, but trust you will have some better preferment and a wider field of duty before long, before Mrs. Gray and myself will be likely to pay you the visit you kindly solicit, for I see no near prospect of our revisiting England, though nothing would please us more. . . .

TO GEORGE ENGELMANN.

7th December, 1853.

I got dreadfully behindhand with everything. "Exploring Expedition Botany" stopped printing for a long time, but is now renewed; three hundred or more pages are printed, and copy sent to printer up to Leguminosæ (excl.). Meanwhile, to look over Brackenridge's manuscript of the Filices, to turn a loose ungrammatical lingo into English, and his

English characters into Latin, is a tedious job; then to read his proofs is another. But if I did not do all this, very bad work indeed would be made of it. Late in October Mrs. Gray and I went to New York for a week, to visit Torrey and to see the New York Exhibition. Returning, I had to bear my part in a course of lectures, which the American Academy gave to the public (to replenish our publication funds); and to prepare and deliver my two lectures, on the relations of plants to the sun, cost me almost the whole of November.

Sprague is too slow, and too feeble in health, to do half what I want done, let alone others. I must import an additional draughtsman. If you know any in Germany good enough, who would come out, let me know at once. If not, I must try at Paris. . . .

TO CHARLES WRIGHT.

May 21, 1853.

The Kurile Islands will be a fine field; and I hope you can do much among them. Collect some specimens of everything you see there. . . .

CAMBRIDGE, February 19, 1854.

Sinner that I am, I have four letters of yours unanswered; the last from Simon's Bay, November 4th. The fact is I do not find time to write half the letters I ought, and those, like yours, which are not to be dispatched on some particular day, I am sure to postpone and neglect interminably. It seems so vague, too, to be writing to a man, you know not where, somewhere on the other side of the world, and you know not when the epistle may reach him, say six months hence.

Nor is it easy to reflect and remember what I have been doing, so as to tell you. . . .

I forgot to tell you, too, that Thurber [1] called on me and offered his plants collected under Bartlett. I have written out the greater part up to the end of Compositæ, my old sticking-place, a number of new things, mostly from deeper down in Sonora than you went, and in southwest California. Beyond doubt Torrey will work up a part. I shall merely furnish characters and botanical remarks to Thurber, and let him do all the rest of the talk. Bartlett is still in hopes that the Senate will print a great report for him. I greatly doubt if they do. If so, Thurber's botany will go as an appendix. If not, he will make a memoir of the things up to Compositæ, and the striking things beyond, and afterwards I may lick up the rest in the general continuation of "Plantæ Wrightianæ," etc.

Meanwhile the United States minister at Mexico has been making a treaty, now before our Senate, for buying a further slice of Chihuahua and Sonora, to take in Lake Guzman and the Sonora country some way south of where you went, that is, below San Pedro. So there will have to be a new survey if this treaty is ratified, and a chance of more botany. I wish you were to be here to attend to it; only you have already taken off the cream of that country, and can now do more, and find more novelty, in some of the countries you are going to.

From Governor Stevens's party, from Minnesota to Washington Territory, north of Oregon, bundles of

[1] George Thurber, 1821–1890; born in Providence; botanist to the United States and Mexican Boundary Survey Commission; then in the Assay Office in New York; later, editor of the *American Agriculturist;* a student of grasses.

plants are sent home to Baird and by him forwarded to me. Wretched specimens, and nothing new among them! . . .

Captains at sea are very apt to get a little crusty, which should be minded just as little as possible. I expect to hear that, after getting well settled and at home in the Vincennes, you find yourself comfortable and all pleasant. Gentlemanly conduct and devotion to one's pursuits will at length make one respected, anywhere.

When you return, I trust you will yourself prepare the botanical report of your cruise. I hope so, for your own sake, both scientifically and because your doing so will keep you on pay some years longer on shore. I will aid you, if I live, most willingly over knotty points, etc.; perhaps would like to do certain families further than that; not, if you will take hold of it yourself, as you ought to do.

I suppose you will have found nothing new at the Cape, though the vegetation there must have been novel to you. It will be pleasant, in the long cruises, to study yourself the plants collected at the last port. Did you get any nice Algæ? Look out for them hereafter.

When you are on surveying-ground, you may probably be transferred back to the steamer again.

Presently your letters will be coming to me via California. I hope to continue to hear such good accounts of your health and activity. Do not measure my interest in your letters by the number I myself write, though I mean to write oftener in future. No news here, scientific or other. Mr. Carey, you know, has gone back to England to live, and has married a young wife there, moreover.

TO W. J. HOOKER.

CAMBRIDGE, March 28, 1854.

I send a glass bottle filled with the pulp and seed of Cereus giganteus as gathered by the natives, and used for food, the same as what I formerly sent you a small quantity of in a letter, trusting the seeds would grow, as they are not subjected to heat in making this jam.

I have some pieces of the wood of the great Wellingtonia tree, which I estimate to be not older probably than the Christian era. Torrey has no fruit, nor have I; but there are some cones in Philadelphia. The wood is very like that of the red-wood, i. e., Taxodium sempervirens. I hope we shall get the male flowers, but I have no correspondent in California, and Torrey no very good or energetic ones.

How hard it is to believe that there is a European war! I trust it will be short. Some of our own people are behaving very badly about Cuba, but it is mostly talk for effect, and will lead to nothing, we hope.

TO GEORGE THURBER.

CAMBRIDGE, 20th April, 1854.

DEAR THURBER, — When yours of the 17th arrived, and till now, I have been too much absorbed in college duties to consider it, as I now rapidly will.

Ranunculus 441. I never liked naming a plant after a person who has had nothing to do with it, as collector, describer, and nothing else; therefore do not like R. Huntiana. We will wait for some other mode of complimenting Mr. Hunt. Moreover, I have hit on a name which pleases me tolerably, viz., R. hydrocharoides, which, by your leave, we will adopt.

Thurberia specific name? That is a question to

consider, and no very pat name at once applicable both to the species and the discoverer occurs to me.

"Thurberia palmata" might pass, and would anglicize into "the handy Thurber," but then the hand has only three fingers.

"T. tridactyla" would meet this; but only birds are tridactylous; besides, the uppermost leaves are entire.

Taking another tack, from its smoothness, we might say, T. glabra or T. lævis; or, as I believe you have not a strong beard, T. imberbis. But, on the whole, perhaps it would be as well to indicate merely the nearest affinity of the genus, and call it "Thurberia thespesioides," as it is nearest Thespesia. Take your choice, though, of any of the above, to which add "T. rosea," if the color of the flower warrants that name.

TO A. DE CANDOLLE.

CAMBRIDGE, June 1, 1854.

MY DEAR FRIEND, — It was with great pleasure that I received from you, two days ago, your letter of the 2d May. I counted myself your debtor, although, indeed, my last letter of 18th October is of later date than yours of the 1st October, which it crossed on the ocean, and I was only waiting until I could announce a small envoi to you, namely, that of a copy of the 1st volume of the "Botany of the United States Exploring Expedition in the South Seas," which has been more than a year in printing. This 4th volume (777 pages) is at length happily printed off, and just in time, too, for sending you a copy (unbound, direct from the printing-office at Philadelphia) in the annual envoi of the Smithsonian Institution.

The atlas, of 100 plates in folio, which should accompany this volume, is by no means ready, owing

to the slowness as well as the feeble health of the artist, Mr. Sprague; perhaps, even, it may not reach you before next year, by the same mode of conveyance.

I have now, indeed, some hopes that the "Flora of North America" may soon be carried through the Gamopetalæ, I elaborating at the same time, in a general memoir, the Gamopetalæ of Wright's, Fendler's, and Lindheimer's collections in continuation; a pretty formidable matter!

In a separate small parcel you will find (in the Smithsonian envoi) some brochures for you. . . . Among them is a short article in "Silliman's Journal," accompanying a reprint of a great part of Dr. Hooker's Introductory Essay to the "Flora of New Zealand." Agassiz here is committed to the view opposite to Hooker's, in an equally extreme form. I wished to interpose some criticisms to both views, but had only time to touch briefly on one or two points. I wait with impatience for your work on "Géographie Botanique," expecting very much from it, from your great ability, long study of the subject, and fairness of mind. Indeed, I was daily expecting to learn that it was published; and now you tell me that the printing is barely begun; the "Prodromus," volume 14, not yet begun! But I am one of the last persons who ought to complain of delay in execution. . . .

From the family of the late M. de Jussieu, you should receive a copy of the "Epistolæ Linnæano-Jussieuanæ," with our late friend's notes, etc., the last scientific work of his too short life.[1] I intended to

[1] From a letter to Sir W. J. Hooker: "Curious that this correspondence, after lying so long, should at length be printed and published in New England." — A. G.

send you a copy myself, but at the request of M. Ramond I surrendered the small extra edition to his charge for distribution. In due time you will have a copy in the volume of the "Memoirs of the American Academy" also. My daguerreotype of M. Jussieu was most opportunely taken. His family, having no recent portrait, have solicited the loan of it, to aid in the preparation of an engraved likeness; and I have placed it in their hands.

I delayed the last sheet of the "Correspondence" long, awaiting an answer to my request for some materials (notices, éloges, etc.), from which I could prepare something of a biographical nature to append, but I received nothing, at least until too late. In the May number of the "Kew Journal of Botany," Hooker has reprinted my brief note; but by some accident, the marks of quotation are omitted from the two last paragraphs, which appear as if written by the editor of the "Journal." . . .

Believe me to remain, my dear friend and honored colleague, as ever, your sincerely attached,

ASA GRAY.

TO W. J. HOOKER.

CAMBRIDGE, February 5, 1855.

MY DEAR SIR WILLIAM, — The inclosed, from our good friend Dr. Short,[1] and the box it advises, came while I was at Washington, from which I have just returned. Mrs. Gray and I have enjoyed our month's holiday very much; though I was kept busy enough,

[1] Charles W. Short, M. D., 1794–1862; professor of materia medica in the University of Transylvania, Lexington, Ky. Removed later to Louisville. Dr. Gray named for him Shortia galacifolia, discovered in Michaux's herbarium in Paris, in 1839.

having to deliver nine lectures in three weeks. We had arranged to have a few days at New York, in which I could work with Dr. Torrey; but the good man was called off to Washington on business just as I left that place, and we crossed en route, and I came on home in consequence. . . .

I am very glad Mr. Smith was pleased with the live plants I sent. Please remind him that I should like to share in the distribution of seeds this spring. And if I find time to make out a short list, I may ask for some live plants again. . . .

I have a Cereus giganteus six inches high, and I saw several others. They have no hair, and appear very unlike C. senilis. . . .

There is an authentic account in some numbers of "Silliman's Journal" last year of the size of that prostrate trunk (Wellingtonia-Washingtonia).

Mr. Blake, at Washington, told me something of it, but I forget the numbers. I will ask him, as he is a reliable person. But 450 feet is rather too tall.

So they would talk about the tree that was felled being 3,000 years old (and took in Lindley), whereas it was not quite 1,300! It appears to grow much faster than S. sempervirens.[1] . . .

[1] On the 2d July, 1872, Dr. Gray saw the Calaveras and Mariposa groves. In the Calaveras Grove he counted, with one of his fellow-travelers, the rings and took measurements of the fallen tree "Hercules." His memoranda of the size, etc., were: —

Height when standing was 315 feet.

A section at 21 feet from ground was 6 feet 10½ inches radius, on the line counted.

	Layers	Rate of growth.	
Counted on it	1,500	First century . .	10¼ in. radius
Uncounted sapwood (est.) .	30	" 400 years .	27¼ " "
" centre " .	10	Last century . .	3½ " "
Growth to 21 feet " .	10	Last 400 years .	14 " "
Estimated age (years) . .	1550		

A great loss in Forbes's death. I have been trembling lest I should hear that Dr. Hooker is chosen to the chair at Edinburgh, which would give him very good pay, I suppose, and he would fill the place well, but it would take him away from special botany, which would be a great pity. . . .

TO A. DE CANDOLLE.

May 29, 1855.

The class which leaves college this summer have bespoken photographic likenesses, on paper, of their professors, — my colleagues and myself, — and this gives me an opportunity of obtaining from the artist some duplicate copies of that for which I sat, and which Mrs. Gray pronounces a very good likeness.

It is not so much vanity that induces me to ask you to accept of the copy I inclose, as the hope of getting yours in return, if that same style be adopted in Geneva, and be as little expensive as here, — to add to the already considerable number of portraits of botanists which make the chief adornment of my rooms, — among which the fine engraving of your distinguished father is conspicuous. I need not say that I should be glad to place the likeness of the son near to that of the father. Ever, my dear De Candolle,

Your sincere and faithful, ASA GRAY.

TO CHARLES WRIGHT.

August 28, 1855.

For a long while now I have been waiting for a good evening when I was not too tired to write you a long letter to meet you in California, in return, though a poor return, for your several nice letters from China.

It is now time my letter was off, — when lo and behold! —

Yesterday morning I was sitting here busy with steady work and not expecting much interruption; now, this evening, my passage is taken, my trunk packed, I am hurriedly closing up affairs, and to-morrow morning go on board steamer America and sail for Liverpool. I have to go and look after my brother-in-law, who is sick in Paris of a fever. No one of the family can go but me, and I manage to find the time. Mr. Loring pays the traveling charges, and off I go, to be gone, however, not over two months, perhaps not so long; a week in Paris, another at Kew, a few days more in England; this must repay me (besides the consciousness of having done my duty) for some twenty odd days of discomfort at sea!

What have I been doing of late? Not much accomplished, i. e., published. Of my "Plantæ Novæ Thurberianæ" and "Notes on Vavæa and Rhytidandra" I have sent you copies already, but I will send you more.

A useful article on the Smithsonian Institution, in July number of "Silliman," probably you have seen in the "Journal;" never mind, I send you a separate copy by mail. Some critical notices which I have no copies of.

What I am about doing, I can always talk largely of. I am preparing a new edition of the "Manual of Botany of the Northern United States," and a new elementary work[1] of a familiar character, to go with it, separate and with original pictures on wood by Sprague, and I am to finish the "Flora" volume and "Plantæ Wrightianæ" with it. I have determined

[1] *First Lessons in Botany.*

Berlandier's plants up to end of Compositæ. Also I have done, along with Torrey, the botany of several expeditions across the continent for railroad surveys, which are soon to be published. Work goes slowly and I grow old. This little holiday will not be a bad thing for me, though it puts me back a little.

TO W. J. HOOKER.

CAMBRIDGE, October 23, 1855.

Now that I am quietly settled at home again, my episode seems almost like a dream, — a very pleasant one, however, since it gave me the pleasure of seeing once more some most valued and near friends. I was absent only six weeks and one day, of which twenty-two days were passed upon the water.

I found all well here on my return, but I was deeply grieved to learn the news of our beloved friend Dr. Torrey's bereavement. It was about a month ago that the companion of his life, almost from his youth, was removed to a better world, after an illness of only a few days. . . . She was one of the most actively good, self-denying persons I ever knew. There are many to mourn at her departure out of her own family, especially among the poor and the distressed. . . . She was one of my earliest and best friends, one to whom I owe more than to almost any person; and I feel the loss as I should that of a near and dear relative.

I wrote you a line, with some inclosures, while at sea, and posted it at Halifax, N. S. . . .

When I send the package from Holton,[1] I wish

[1] Isaac F. Holton, M. D., 1813–1874; teacher and professor of natural science in Vermont, and missionary pastor in Illinois. Published in 1857 *New Granada, Twenty Months in the Andes.*

also to send you live seedlings of a palm from Sonora, Mexico, raised from seeds gathered by Thurber, and one or two other things.

I do not forget the large "cypress knees" I promised, which will be rather striking in your famous museum, and I look out for an opportunity to send by sailing vessel direct to London.

Remember me affectionately to Lady Hooker (for whom Mrs. Gray incloses a few lines) and most cordially to Mr. Bentham, who so kindly came down from the country to give me the opportunity of seeing him, for which I am greatly obliged.

P. S. — I forgot to tell you that, by the hands of Hon. Miss Murray (who returns to England by this week's steamer), I send you the September number of "Silliman's Journal." Should she forget to send it to you, please remind her when she comes to Kew, as assuredly she will, to talk about her Florida new fern. I have filled up the Ward case which she brought over, also a box of American plants which she takes, I suppose, for Mr. Fox Strangways. Her various boxes and packages will nearly fill the ship, I should think.

Miss Murray is a most lively, most active person, has traveled widely through the country, and traversed rough places, such as no other woman past sixty ever did. She has seen a great deal, but heard very little, I should think, as she talks incessantly, and in a lively, interesting way, too.

You will not be disappointed by the suppression of her manuscript by her English friends, I suppose, for she is fully determined to rush into print, to print her journal just as it was written from day to day; for she now feels she has a mission to rescue the South

from the obloquy and wrong heaped upon it by us of the North, and by England. Save the mark!

At any rate, her journal will be piquant.

I am anxious to know how far we can economically use the post for the transmission of printed matter. Perhaps I could safely send you "Silliman's Journal" in this way. As an experiment I now send you our University catalogue. No, it will not do, I see, for anything weighing over two ounces or three. Beyond this the rates increase woefully. . . .

TO GEORGE ENGELMANN.

18th October, 1855.

Yours of August 30th (answered by my wife) was written when I was one day at sea. Yours of October 13, which arrived to-day, was written two days after I reached home again. I had two very pleasant voyages, on the whole, and not long, ten and a half and eleven and a half days; eleven days in Paris (where I was detained a little by a severe cold on my lungs) and a week in England, mostly at London and Kew. I found my brother-in-law so convalescent that I might have stayed at home, and I brought him home with me in good condition. We had hoped, till the last moment, to get places in the steamer of the 13th October, and to have had a fortnight more in England. But all the places had been engaged for months, and nobody was giving up berths up to the time we sailed; so we had to come in steamer of the 29th ult., where we got a good stateroom by great luck, though the vessel was greatly crowded. Dr. Joseph D. Hooker (whom I had wanted to see for some time) being away in Germany, and time being extremely valuable to me here, I was on the whole very glad to get home.

The naturalists at Paris were en vacance, and mostly away. I saw only Brongniart, Spach, Gay, Dr. Montagne, and Trécul (who sent, I believe, some pamphlets for you; the package is not yet unpacked), and my good friend Vilmorin. Boissier was there from Geneva.

In England I spent all the little time I could command at dear Hooker's at Kew; and Bentham, then in the country, came down to see me. I made a long and interesting call on Robert Brown, who is very old, but full of interest. I shall not again see this Nestor of botanists, as well as facile princeps, in this world.

Hooker was much delighted when I told him you were coming next spring to see him at Kew. He insisted upon taking me over to see the Cactus house, and all through it, so that I might tell you what a mass of Cacteæ there are there; and he will be much pleased to have you work among them. He spoke about his Cuscuteæ, but was not at all displeased at your retaining them; begged you would work them up if possible before returning them. You will be charmed with Sir William when you see him.

As to the "Manual," my plan, as at present advised, is to cross the line of slavery a little, to take in Kentucky and Virginia; this makes the real division, in botanical geography, between North and South. It should be Northern ground, too, down to this line: for north of it slave labor is good for nothing; and there would be no slaves there, except for the Southern market. I cannot take in Missouri, for I must make the Mississippi my boundary. But all your St. Louis plants cross into Illinois, do they not? Tell me how this is. I shall get at work at the new edition soon. I shall first press on the "Lessons" a little further.

About Fouquiera; I have examined it here repeatedly on the live plant, which every year prolongs its main axis an inch or two. And I took leaves to Providence to show there, especially to remove any lingering doubt on Torrey's mind. For Torrey would long have it that the spine was a primary leaf, and that an axillary leaf adhered to it by its petiole. He now knows better.

I just saw Agassiz. He looks well and strong. . . .

I read Alphonse De Candolle's "Géographie Botanique Raisonnée" on the voyage home: a most able work it is, full of interesting matter very methodically arranged. Hooker and Thomson's "Flora Indica," vol. i., is famous for its able introductory essay, etc.

TO A. DE CANDOLLE.

October 27, 1855.

Your welcome letter of the 7th of August duly reached me. I meant to have surprised you by an answer dated at Paris; but the eleven days I passed there were too busily occupied to allow it. M. Boissier will have told you of my sudden voyage, and the cause of it. I was absent from home only six weeks and a day; and twenty-two days of the forty-three were passed on the water. On returning home I found here:

1. The excellent lithographed portrait of yourself, a pleasing and pretty good likeness. Of the three copies I have offered one to Torrey, the other to Short.

2. The copy of "Géographie Botanique," which you so kindly addressed to me. (I have already learned that Agassiz and Darlington have theirs; but Torrey not his, and I have directed inquiries to be made.) This was not my first introduction to the

book; for I bought a copy of Masson in Paris, to read on the voyage, when I could have more leisure than at home. And I carefully read it then (after having dispatched Hooker and Thomson's "Flora Indica") up as far as to p. 1087, when I was obliged by the close of the voyage to break off, at a very interesting point; and I cannot yet resume the reading.

I cannot sufficiently express my profound admiration of this book, so thorough and conscientious, so capital in its method, and embodying such a vast amount of facts well discussed; it might well be the work of a long life. I have marked in many places points on which I may have a word to say, sometimes little details to add or correct, sometimes a criticism to hazard.

If time (which is now precious to me) permit, I will write a series of articles on it for "Silliman's Journal," which will serve to make the work generally known to our people, and in which I can insert any commentaries I have time and room for. One article I will devote to plants introduced into this country from Europe. Now that you have so well collected and digested the principal information, it will be easy to complete and correct some points; and this may be useful to you hereafter, as well as to me. . . .

I will procure from Dr. Harris any information he has collected about the potato, which, if Raleigh took it from Virginia to England, must have been brought to Virginia from South America. It was certainly unknown to our aborigines, who, however, along with maize, cultivated beans (Phaseoli) and squashes (Cucurbitæ).

Dr. Hooker had written to me, eulogizing your work in the highest terms. I missed seeing him when in England.

Agassiz speaks most highly of it; but I think he has only looked rapidly through its pages as yet. . . .

I am at this moment preparing to begin the printing of the 2d edition of my "Manual of the Botany of the Northern States." . . .

In consequence of your book, I shall take pains to classify the introduced plants, according to the degree of naturalization, etc.

Many thanks for sending me your portrait. I am already quite rich in the likenesses of botanists, many of which adorn the walls of my apartments. . . .

Believe me to remain, my dear friend, yours very faithfully and truly, ASA GRAY.

TO W. J. HOOKER.

CAMBRIDGE, February 25, 1856.

MY DEAR SIR WILLIAM, — Holton is bringing out a book upon New Granada which will be interesting. . . .

The cypress knee sent was the best and handsomest I had, though not the largest. I am glad it pleases you. But you mistook what I said, or meant to say, which was, that tucked away in the hollow you would find placed a specimen of a forming knee, not much bigger than your knuckle, on a piece of root a foot or so long. Was this overlooked or lost? Please tell me; for I can replace it with another, and physiologically it would be well to show the formation in its various stages. . . .

I want to send you a book by a young friend of ours, Olmsted, on the seaboard slave States,[1] an admirable volume, full of information, and lively withal.

[1] *A Journey in the Seaboard Slave States, with Remarks on their Economy.* By Frederic Law Olmsted. New York, 1856.

I wait for an opportunity. Lady Hooker will be interested in it. Our united warm regards to her.

Thanks to the Duke for anything to facilitate transmission of printed matter. But it is still high; for example, your "Journal," which I get by post, costs 6d. each number, paid in London, and about 1d. more paid here. There is still room for improvement. I dare not send you "Silliman's Journal" yet by post.

June 30, 1856.

Charles Wright, who was in the North Pacific Expedition under Ringgold and Rogers, has left his ship at California instead of making the voyage round Cape Horn, and crossed over the Nicaragua route, intending to botanize there some months. Finding himself there among our vile filibustering people, and all in confusion, however, he was soon obliged to come on home. He is awaiting the arrival of his ship, and will not till this autumn be able to touch his Pacific collections, of which the best and principal were made in Hongkong, Bonin, and the Loo Choo Islands and Japan. That they are not larger is not his fault.

Wright has a perfect passion for collecting plants; and already begins to plan other explorations. To satisfy his cravings for a while, I have proposed to him to go to St. Iago de Cuba, and explore that end of the island. What do you think of it? Has any botanist collected there? Would it be too like Jamaica to offer much novelty? But to return. In Nicaragua, Wright collected a goodly quantity of seeds, one set of which he wishes me to send to you; a present to Kew Gardens, as I understand it. . . .

By the way, it was most lucky that I hurried up and had sent on to you the copy of Brackenridge's

"Filices;" for a fire in Philadelphia has consumed all of the poor fellow's edition of the volume except ten copies which had been sold mostly in Europe. A sad and a heavy loss to B., who had no insurance, and something to me who had advanced to him the paper for printing it on, which now the poor fellow is in no condition to pay for. I have not even a copy of the atlas myself, but I shall get one from the government plates, which are preserved. Brackenridge utterly despairs of reprinting it. But possibly the government will set up the type for him again, as they have also lost a part of their small impression. Otherwise the book will have the value of excessive rarity, if it has no other. . .

May 25, 1857.

I hear with delight that you are meditating a trip to America, and I write forthwith to express my own and Mrs. Gray's and my good father-in-law's earnest hope that you will come over, even if it be for a few weeks only. The rest of the voyage cannot but be useful to so busy a person as you constantly are, and a run through the country, and a sight of the Yankee world, would interest you. At the Montreal scientific meeting you would see several old friends and many new ones. Torrey, Greene, Darlington,[1] James,[2] etc., would be half frantic with pleasure at the thought of seeing you; so it will not do to hint at such a thing, until you give me authority; and as for my wife and

[1] William Darlington, M. D., 1782–1863, of West Chester, Penn.; author of *Flora Cestrica*, "one of the best of local Floras," and *Memorials of Bartram and Marshall*, etc. "A most faithful botanist. His forte was the clear and accurate description of plants" [A. G.].

[2] Thomas Potts James, 1804–1882. Born in Radnor, Penn. A proficient and authority in bryology.

me, we will look after you like dutiful children, will go with you to Niagara, or to Lake Superior, if you will go so far, for there is nothing would give us so much pleasure as a visit from you; and if you would bring Lady Hooker or Mrs. Evans, or both, with you, it would be charming. The voyage is nothing to speak of, traveling here is easy and rapid, although not so very comfortable, as in England, and a good deal of the country can be seen in a few weeks without much fatigue. Pray do come, and exceedingly gratify,

Your affectionate and faithful A. GRAY.

TO JAMES D. DANA.

December 13, 1856.

MY DEAR DANA, — I duly received the sheets I asked for.

The right way to bring a series of pretty interesting general questions towards settlement is perhaps in hand (though I do not expect myself to bring anything important to bear on it), viz., for a number of totally independent naturalists, of widely different pursuits and antecedents, to environ it on all sides, work towards a common centre, but each to work perfectly independently. Such men as Darwin, Dr. Hooker, De Candolle, Agassiz, and myself, — most of them with no theory they are bound to support, — ought only to bring out some good results. And the less each one is influenced by the other's mode of viewing things the better. For my part, in respect to the bearings of the distribution of plants, etc., I am determined to know no theory, but to see what the facts tend to show, when fairly treated.

On the subject of species, their nature, distribution, what system in natural history is, etc., certain

inferences are slowly settling themselves in my mind, or taking shape; but on some of the most vexed questions I have as yet no opinion whatever, and no very strong bias, thanks, partly, to the fact that I can think of and investigate such matters only now and then, and in a very desultory way.

I cannot say that I believe in centres of radiation for groups of species. From Darwin's questions to me I think I perceive some of the grounds on which he would maintain it. One is attended to on page 77 of the January number [of "Silliman's Journal"], but I am not clear that they are not just as susceptible of other interpretation.

But as to a centre of radiation for each separate species, I must say I have a bias that way. You seem to have also, and you can best judge whether this, combined with geological considerations, would not involve centres of radiation for groups of species as well, to a certain extent. Would not the fact that the members of peculiar groups (in Vegetable Kingdom) are to a great extent localized favor that view?

I am glad to hear that your idea of the unity of the human species is confirmed more and more. The evidence seems to me most strongly to favor it. And you well discriminate the separate questions of unity of birthplace and unity of parentage. . . .

As to the physical question, surely you do not suppose that, in a fresh race, the one or two necessary close intermarriages would sensibly deteriorate the stock. Look at domestic animals of peculiar races, — how long you can breed in and in without much abatement of health or vigor!

Did you ever consider the question of the cause of deterioration from interbreeding?

I think I have somewhere in the "Journal" stated my notion about it, or hinted at it. If not, I will, some day; for I have a pretty decided opinion about it: that hereditary transmission of individual peculiarities involves also, among them, the transmission of disease, or tendency to disease, — a constantly increasing heritage of liability as interbreeding goes on; in plants well exemplified by maladies affecting old cultivated varieties long propagated by division.

I should much enjoy a visit with you at New Haven, and so would my wife, no less. Hope we may some day. . . .

Yours faithfully, A. GRAY.

TO A. DE CANDOLLE.

March 26, 1857.

Fendler is back again in the country of Venezuela, and making fine collections. He will complete the sets of his former distribution, but not send the same things over again. He has found many more Filices. Will you and M. Dunant continue?

On Wright's return home he was troubled with rheumatism, and longed for a warm climate to pass the winter in. So I sent him to the east end of Cuba (where I wished the Huets to go). He is doing very well there.

Oregon is still in a disturbed and unsafe state. But I should inform you that a commission has been raised to run our northwestern boundary with the British government; and it will probably be commenced this year. The party would have a sufficient escort, and this would give the Huets a safe opportunity for botanizing across the continent in a high latitude, if they are so disposed. I know not any details, but

I could learn them, if need be, and there would be no difficulty in procuring needful protection for the Huets, they finding their own subsistence.

I have published two statistical articles, based on my "Botany of the Northern States," in "Silliman's Journal," and a third is now printing in that journal for May. I shall have extra copies to send you. There are other topics I mean to take up, if I can find time. . . .

TO GEORGE BENTHAM.

May 4, 1857.

Since your letter came I have looked up and read the article in the "Edinburgh," and like it much. Your few words about Genera, page 517, appear to comprise the gist of the whole matter. As to your fuller exposition, not being able to lay hands on the "Literary Gazette," I wait to see your article in the "Journal of the Linnæan Society."

I am particularly interested in what you write of your popular "British Flora," and the English names; and I am going to ask you to explain to me more fully the principles on which you proceed. For, if practicable, I am going to have occasion to do something of the sort here. Pray illustrate your plan a little; as I see much difficulty in carrying it out, except in so small a flora as the British, where every plant has a popular name. One additional difficulty here is that our common English names are mostly misapplied ones, and the plants that have indigenous trivial names have too many of them, varying in different parts of the country.

How do you name the orders? What relation will you have between your specific names and your

generic, and how many words will you allow each to consist of?

Give me your names through some family, say Ranunculaceæ. If I can see my way clear, I shall follow your lead, or cause it to be followed on an occasion which will soon be presented.

I wish I had known of Clitoria Mariana-acuminata, etc., in time to add it to my list in the last number of "Silliman's Journal;" a copy of the article was sent to Dr. Hooker by post last week. I will send more, from my extras, presently.

I am quite prepared for what you say about interchange of species of United States and Europe taking place via Asia, instead of across the Atlantic; but you will see there are a few, besides aquatics (Subularia, Eriocaulon, etc.), which would seem to have taken the shorter cut.

As respects identical species, interchange is the only thing that, on our views of what a species is, will explain the occurrence of the same species here and there. But as to genera, I do not yet feel free to assume an interchange, or a former continuity of land, between two widely separated regions on account of their having identical genera or closely related species. I see no reason why cognate species may not have been originally given to most widely separated stations; and, as to the facts of association, can we say more than this, that the species of a genus are apt to be confined to one part of the world? Are there not too many cases to the contrary to warrant our suspecting former continuity of two remote districts on account of common genera? Peculiar genera, such as Torreya, Illicium, Philadelphus, Astilbe, etc., divided between Japan and the United States of

America, indicate some peculiar relation, and are most noteworthy, but I do not see why it points to connection.

I am very glad you are turning your good, logical mind and immense knowledge to this class of topics; but do not let it run off with too much of your valuable time. I take far more satisfaction in discussing questions of botanical affinity; and long to get back to that sort of work. Just now, I must needs be absorbed in elementary work and teaching, but look to see an end of this.

I have been watching the development of the ovules of Magnolia; nothing can be more normal than they are, in the early stages.

When Wright comes home from Cuba I expect to get hold of his considerable north Japan collection, which I expect to find very interesting on questions of distribution, the very questions you ask me to consider.

I doubt if our "mountain backbone" actually stops any species, itself, from advancing east or west.

I wish you would compare our White Birch with the European B. alba, and let me know the result. Also the Chestnuts. . . .

TO R. W. CHURCH.

CAMBRIDGE, May 15, 1857.

An acquaintance en route for Scotland has offered to take some small parcels for me.

Among them is one I have taken the liberty to address to you, a copy of a very elementary book[1] I have prepared as an introduction to my favorite science, finding there was no one in use here which I

[1] *First Lessons.*

thought fit to put into the hands of young beginners. Here botany is taught, somehow or other, in most schools, and generally by incompetent teachers from wretched books, i. e., those used in the ordinary schools and for young people.

I have endeavored, in the little book I send you, to make real science as easy and simple as possible. I doubt if I have yet aimed low enough; but the book seems to take, and promises to be useful.

Although not adapted for your meridian (where you have doubtless good elementary books enough), yet when your boy, who must now be five or six years old, if he has been spared to you, gets a few years older, I shall be much gratified if this little volume should interest him, and aid you somewhat in developing in his mind a love for the study of nature in one of its pleasantest branches. . . .

I want to offer you my new "Manual of the Botany of the Northern United States," not that it can be of any use or of much interest to you, but must not load my kind acquaintance with more parcels. I wait for an opportunity of sending through the booksellers, before long.

TO JAMES D. DANA.

November 7, 1857.

If you have plenty, please send me two more copies of your "Thoughts on Species."

I first read it carefully, a week ago, and I meant to write you at once how I like it, and a few remarks, but something prevented at the time, and I have been very busy and preoccupied ever since.

For the reason that I like the general doctrine, and wish to see it established, so much the more I am

bound to try all the steps of the reasoning, and all the facts it rests on, impartially, and even to suggest all the adverse criticism I can think of. When I read the pamphlet I jotted down on the margin some notes of what struck me at the time. I will glance at them again, and see if, on reflection, they appear likely to be of the least use to you, and if so will send them, taking it for granted that you rather like to be criticised, as I am sure I do, when the object is the surer establishment of truth.

In your idea of species as specific amount or kind of concentrated force, you fall back upon the broadest and most fundamental views, and develop it, it seems to me, with great ability and cogency.

Taking the cue of species, if I may so say, from the inorganic, you develop the subject to great advantage for your view, and all you say must have great weight, in "reasoning from the general."

But in reasoning from inorganic species to organic species, and in making it tell where you want it and for what you want it to tell, you must be sure that you are using the word "species" in the same sense in the two, that the one is really an equivalent of the other. That is what I am not yet convinced of. And so to me the argument comes only with the force of an analogy, whereas I suppose you want it to come as demonstration. Very likely you could convince me that there is no fallacy in reasoning from the one to the other to the extent you do. But all my experience makes me cautious and slow about building too much upon analogies; and until I see further and clearer, I must continue to think that there is an essential difference between kinds of animals or plants and kinds of matter. How far we may safely reason

from the one to the other is the question. If we may do so even as far as you do, might not Agassiz (at least plausibly) say, that as the species Iron was created in a vast number of individuals over the whole earth, so the presumption is that any given species of plants or animals was originated in as many individuals as there are now, and over as wide an area, the human species under as great diversities as it now has (barring historical intermixture) ? — so reducing the question between you to insignificance, because then the question whether men are of one or of several species would no longer be a question of fact, or of much consequence.

You can answer him from another starting-point, no doubt ; but he may still insist that it is a legitimate carrying out of your own principle. . . .

The tendency of my mind is opposed to this sort of view ; but you may be sure that before long there must be one more resurrection of the development theory in a new form, obviating many of the arguments against it, and presenting a more respectable and more formidable appearance than it ever has before. . . .

I wanted to say something on the last two pages, but as I have nothing in particular to except to, and much to approve, and as it is late bedtime, I spare you further comments.

I set out to find flaws, as likely to be more suggestive and therefore far more useful to you than any amount of praise, with which I could fill page after page.

TO W. J. HOOKER.

CAMBRIDGE, December 6, 1857.

Your first letter is now gone to Sullivant, because you speak of him so handsomely, and say that Mitten is instructed to prepare a set of Mosses for him. A noble fellow is Sullivant and deserves all you say of him and his works. The more you get to know of him the better you will like him.

Let me tell you about my "Manual of the Botany of the Northern United States." It was quite impossible, of course, that the publishers should provide such illustrations as the fourteen plates and keep the book at a salable price, so Sullivant, on his own motion, had the eight plates of Musci engraved in copper, at his own cost, for $630 (about £126), and gave them to the work, after printing 250 copies for his separate booklet I sent you. I gave the six plates of Ferns, etc., cut on stone by Sprague to complete the plan. In the "Journal" you are wrong in supposing that the Musci were even drawn by Sprague. If in time please correct this when you notice his book. Sullivant drew them all with his own hands (as he did those of former memoirs which pleased you well), and had them copied and reduced to proper size by a German artist he employs. So that besides his labor, he has expended at least £180 in money, on these plates. They were executed on copper by a young engraver in Boston.

Your second letter, begun the day the other was dispatched, reached me a few days ago, while dear Torrey was here on a visit. He has just returned to New York. We called to see Greene, but he was not in. . . .

TO GEORGE BENTHAM.

November 16, 1857.

I have noted with interest Naudin's doings in Cucurbitacæ. It has induced me to look a little into the geographical question, and I begin really to think C. Pepo, and perhaps others, are American. Mr. Sophocles, our Greek tutor, who knows cultivated plants well, and everything about mediæval and ancient Greek, is quite clear that the ancients knew nothing of pumpkins and winter squashes, and is able to correct De Candolle's lucubrations in one or two points. Our New England and Canadian aborigines had beans, too. These and Cucurbita came north from a warmer climate with maize, I presume. . . .

When I got your proof-sheet of the "British Flora" and your long letter of 28th May, there was something I wanted to talk about, I dare say, but there was no writing then, as you had gone abroad, and now the subject is all out of my head. But I have occasion to take up the subject of popular names of plants quite seriously in a week or two, and I may have something to remark.

I wish to follow your lead, but should be disposed to go rather farther than you do in adopting English names. For instance, I would certainly adopt Mousetail instead of Myosure. Myosure is hardly more English than before clipping its tail a little, and Mousetail is the exact equivalent. Corydal and Astragal I quite like, as they have really no English names. I incline to Crowfoot as a generic appellation. To extend it over the whole genus is only doing what is so often done with scientific generic names. In the case of genera having very strongly marked subgenera, would it not be possible to let the subgeneric name govern the popular nomenclature? as say —

Pear; genus = Pyrus, under it
Pear, with its species;
Apple, 1. Common Apple,
2. Crab-Apple, etc.

There are formidable difficulties about this popular nomenclature, yet they must be surmounted in some way or other.

As we are making much of English, why not say "rootstock" instead of "rhizome." I do not like French forms. I would even say "pod" instead of "capsule," in popular parlance.

Kindly send me proofs as you go on. I want much to see them.

Wright's collections in North Pacific Expedition are here, and he is turning over his Behring Straits collection and trying to work it out, with some help from me. There is a Hongkong collection; there may be some of these he would like to ask you to name, so far as you may off hand. The Japan collection I will elaborate myself. There is not so much from the north as I expected. They had no chance to explore the small islands connecting with the Kurile Islands. I have only peeped into one or two parcels; but in one I saw two things which will interest you as much as they did me. Imagine the two most characteristic possible eastern United States plants, Caulophyllum and Diphylleia, both, I believe, our very species. Tell this to Dr. Hooker!

The only domestic news I have to tell you is, that on a hot August day our beloved Newfoundland dog was found dead, — really a sad loss. To console us my brother-in-law, a fortnight after, sent me a puppy of the same breed, an uneasy, frolicsome, awkward fellow yet, but promising to be intelligent and very

handsome. We could not bear to give him the name of his lamented predecessor; so Mrs. Gray named him Hans, — a souvenir of Pontrilas. . . .

Dr. Gray's dogs and cats were always well-recognized members of the family. He had a great love of animals, which was warmly returned by his different pets. In his early married life the kittens he helped raise by feeding them with a dropping-tube from his microscope rather preferred him to their young and careless mother, and, confounding all other men with him, were perpetually scrambling into laps, to the surprise of callers. Two grew into fine cats, who demanded a regular attention and consideration from him, reminding him by gentle taps, one on each side, when bedtime came.

Of his first dog, he always said that they stood more in the relation of brothers than master and dog; and the dog felt a guardian care of him. The different characters of his two Newfoundland dogs, and of the smaller ones he had later, interested him, for they were singularly different, though both the Newfoundlands shared his affection for a pretty Maltese cat who had succeeded the other cats; they were especially fond of her kittens and attentive to them, allowing them all sorts of liberties. The cats and dogs always lived affectionately together. Dr. Gray always recognized their good consciences, which varied somewhat with the different type of animal, and considered that the size of different breeds had much to do with their characteristics. They always learned to eat what their master did; not so much, he would say, from any preference for oysters and dry toast, as that they were ambitious to do as far as possible what he did.

He was very skillful in the handling of animals, and they recognized it in allowing him to perform small surgical operations, to dress wounds, etc., with a touching trust and submission.

TO GEORGE BENTHAM.

March 9, 1858.

My dear Bentham, — Many thanks for yours of February 14. Although much pleased to hear from you, I cannot expect to hear often, unless you have something special to say. No one but Hooker can write long and frequent letters while he is doing such a vast amount of work, and keeping up such a fresh, and keen, and scrutinizing interest in such a great variety of subjects. I wonder how he does it. How well oiled the machinery of his brain must be to do it all without great wear and tear! If you or I had half these matters to think of at once, we should go distracted. Warn Hooker to take good care of himself and not break down in health. It is a facility which he inherits, that of turning from one thing to another without loss of time or of working power.

I shall be pleased to see the "Handbook" when it is out. Never mind what people say. I dare say the little book will do a great deal of good. . . .

I am glad you will distribute more of Spruce's plants. I want especially any of his Andes collections, for Baños was one of our Exploring Expedition stations. I am going to finish up our Exploring Expedition this year (D. V.), and have done with it. That and some other things done, and I dream of coming over to England, and working at nothing but "North American Flora," de novo. I hope I may, and that I shall find you and Mrs. B. as fresh as ever, and enjoying yourselves to the full. . . .

April 26.

My last book[1] in elementary botany is now just off my hands, and will be out in a fortnight. I hope it will be of use. Forgive me for writing horn-books, and I am now done with that sort of work. There were several convincing reasons for doing it.

TO DANIEL CADY EATON.[2]

February 23, 1858.

I dare say you may learn something here as to teaching, etc., if you can pick it up yourself, which, after all, is the only way anything worth knowing is obtained. But from now to the end of April I am just overwhelmed with work, and shall have no time to give any special instruction.

At the opening of the term I begin my drilling of Sophomores in the "Botanical Text-Book." My lectures to a selection of Juniors, on Systematic Botany, I do not ordinarily commence till April 1, but this year I am able to begin early in March, though not much work is done till May. You might attend Agassiz's lectures, but he will not be back from Florida as soon as the opening of the term.

Let me know how much instruction you have to give this year, and of what sort, and I can see whether I can help you much. I dare say you will teach very well.

There are certain little matters you might pick up about class illustration and manipulation without it costing you much time. We were just thinking of sending you Wright's Hongkong ferns.

[1] *How Plants Grow.* Sir Joseph Hooker in *Nature*, February 16, 1888, says of *How Plants Grow* and *How Plants Behave*, "that for charm of matter and style they have no equal in botanical literature"

[2] Daniel Cady Eaton, professor of botany at Yale.

Suppose you come on, count as a pupil, or as a visitor, as you like, work away as you think best, making preparations for your course, in which I will help you all I can. And at the same time work up Wright's Hongkong and Bonin and Japan ferns (bring any books you want which I have not). I want to drill you a little at systematic work, and think you will learn something that way. Come straight here. We shall want you to stay with us, if the house is empty. And if not we shall make no difficulty of sending you down to the Brattle House. But it would be so much more convenient here.

I am very desirous that you should be duly established at Yale, and have no doubt you will satisfy the college and fill the place with comfort and credit.

We will talk over matters at odd moments when you come.

I shall be most glad to help you as a friend and fellow-worker; but I cannot promise any special instruction, and shall take no fee. "Dog does not eat dog," is the saying, you know.

Judge Lowell writes, in 1888, "I was in college when Dr. Gray was appointed to his professorship at Harvard, and ours was, I think, the first or one of the first classes to whom he lectured. I remember his lectures well, they were so full of knowledge and of enthusiasm and so calculated to impress the young mind.

"I suppose he had not lectured much of late years; and in his many other successes, his powers as a lecturer may have been overlooked by those who have written of him."

Dr. Rothrock, in his address before the memorial meeting of the botanical section of the Academy at

Philadelphia, speaks of Dr. Gray's patient drilling of him in writing his thesis, making him go over and over it again, until it had been rewritten six times before he allowed him to be satisfied with it. His pupils would always remember his comment when satisfied, — "That is neatly stated."

And Dr. Farlow shows the picturesque figure "hurrying down Garden Street (on lecture mornings) so covered by the mass of branches and flowers which were to illustrate the lecture that his head and body were hardly visible." [1]

"The few who gathered around the little table in Harvard Hall, in pursuit of knowledge which did not count in the college reckoning, will never forget the untiring patience with which he explained what then seemed difficult, the contagious enthusiasm with which he led them on from simple facts toward the higher fields of science, or the tender personal interest which he showed in their hopes and half-formed plans for the future; an interest which, on his part, only strengthened as years passed on, and makes them now mourn, not so much the death of a great botanist as the loss of a sympathizing friend." [2]

TO W. J. HOOKER.

April 30, 1858.

I must tell you that in humble imitation of Kew, I am going to establish a museum of vegetable products, etc., in our university.

The erection of a new building for the Museum of Comparative Anatomy and for the Mineralogical Cabinet liberates the very fine hall used for the Miner-

[1] *Botanical Gazette*, March, 1888.

[2] Memoir of Dr. Gray, American Academy, 1888.

alogical Cabinet formerly. This I have applied for, and obtained for my purposes, and am taking into it the various things I have picked up from time to time. It is a room about forty-five feet long, with deep alcoves the whole length of each side, already shelved, and with glass doors to the cases, a window in each of the ten alcoves; the centre, or nave, serves for my lecture-room. So now I shall beg all my students and correspondents to send me every sort of vegetable thing; so if there is anything you need still from this country you should let me know; and whenever you are overrun with duplicate woods, etc., just think how welcome such things would be here, and how they may stimulate our collectors and travelers, who perchance may occasionally send me something that would fill some gap in the Kew museum.

Mr. Wright is having a good training here, and when he goes again to Cuba, or elsewhere, will do much better, both as to common botanical specimens and for collecting vegetable products and curiosities.

Dr. A. A. Gould, who will bring a line to you, is a physician in Boston, and one of our best zoölogists, especially in conchology, etc.; a most excellent man. He takes a well-deserved holiday for three months or so, mostly in a run over the Continent. He has London friends in plenty. He may like to see Kew Gardens before one o'clock, and would be pleased to pay his respects to you in person, if his time allows a flying visit to Kew before he proceeds to the Continent.

Just at this moment, and since my parcel of books for you left the house, the May number of "Silliman's Journal" has come in. I will ask Dr. Gould to take it to you. . . .

June 21.

About the museum. Ours is to be not economical (except in the sense that it must not cost anything to speak of) but for class illustration and botanical research. So I want woods, fruits, seeds, etc., and must keep all within narrow limits. All I could venture to ask from you is that whenever your keeper or Dr. Hooker should be throwing out duplicates to save room, you would have some such things boxed up for me. I should indeed like to go over to you, and select for myself, as you and Dr. Hooker suggest. Joseph suggests that I should be sent over by the university for the purpose! His whole idea is as magnificent as my plan is humble. I fear I must always travel and cross the ocean at my own charges. But the proposition suggests to me that, when I am ready to revisit England, this will be a good ground for asking leave of absence without cutting off my pay. But there is much to be done before I can leave home again, and when I shall be ready and able to do so, if it please Providence that I may be, I want two full years and most of it at Kew. How I hope it may be done in your day, and that I may receive your cordial greeting, and find you as hale and as actively useful as ever. But "l'homme propose," etc. We are delighted to hear from Mrs. E. that you are well and strong again.

Boott kindly writes me of Brown by every mail; by the next arrival we must expect to hear that he is no more. . . .

Wherever Wright goes, you may rely upon the fullest set of his gatherings, and we may expect they will be better than formerly. For (what I never thought he would have patience for) he has really

taken to studying botany, which he never did before, and digs away at his dried specimens most perseveringly. At first it went against the grain, and he used to wish himself far off in the woods. But he has kept on for six or eight months, and now generally prefers to find out a plant by his own skill, rather than have me tell him what it is; so he will be able to collect more understandingly, and the year passed here will not be lost time.

Dr. Robert Brown died shortly after the date of this letter. In Dr. Gray's memoir of him, he says: —

"Upon the death of Robert Brown, it was remarked that, next to Humboldt, his name adorned the list of a greater number of scientific societies than that of any other naturalist or philosopher. It was Humboldt himself who, many years ago, saluted Brown with the appellation, 'Botanicorum facile princeps,' and the universal consent of botanists recognized and confirmed the title. . . . Brown delighted to rise from a special case to high and wide generalizations; and was apt to draw most important and always irresistible conclusions from small selected data or particular points of structure. He had unequaled skill in finding decisive instances. . . . So all his discoveries and all his notes and observations are fertile far beyond the reader's expectation. Perhaps no naturalist ever taught so much in writing so little. . . . Those who knew him as a man will bear unanimous testimony to the unvarying simplicity, truthfulness, and benevolence of his character, as well as to the singular uprightness of his judgment." [1]

[1] *Scientific Papers of Asa Gray*, vol. ii.

TO R. W. CHURCH.

June 1, 1858.

Your gift of the "Oxford Essays" came to me, and was partly read with much interest before the arrival of your kind letter of the 31st March. Many thanks for both.

I know too little of French literature, early or late, but I admire your article for its neat and delicate delineation and discrimination of character. I read with interest, not unmingled with concern, Baden Powell's and Wilson's articles. The latter person I heard preach one of the Bampton lectures at Oxford, 1851. Into what will the latitudinarian school, if I may so call it, develop at Oxford?

Gladstone's article I have not had time to read yet, nor his large work, which probably will reach us presently, through our book club, — I hope at a time when I have more leisure than now.

Last week the publishers, at my request, sent to Trübner & Company, American booksellers (12 or 20) Paternoster Row, a copy of a new and more elementary book[1] of mine than the one you are pleased to compliment. I intended that as a kind of horn-book, which Dr. Hooker insists it is not; and as something more simple was wanted here, to lead the way both to the "Lessons" and especially to the "Manual," which is rather strong for beginners, I have tried again, and you will see the result. I should have made the little "Popular Flora" fuller if the publishers had allowed more room.

Having last year reëdited my "Botanical Textbook" (of which, to complete your set, a copy is also sent to you, through Trübner), I have now done my

[1] *How Plants Grow.*

part in elementary botanical writing, and I return with zest to my drier investigations, in which I have much to do.

If I ever find time I am greatly disposed to write some day upon the principles of classification, — the ground in nature for classification, the nature and distribution and probable origin of species, — knotty points, upon which I incline to differ decidedly from Agassiz, and considerably from the common notions.

Some of the more immediate and best-established deductions I hope to bring out in a paper I shall soon be occupied with, containing the results of a comparison of the flora of Japan (in which I have new materials) with our own of the United States of America.

My college work keeps me very busy at this season.

. . . I see no near prospect of revisiting the Old World. The commercial troubles last autumn have reduced our moderate means and prospects a little. But if I live I must yet have two years' work in England and on the Continent. With great regard, I remain, Yours very faithfully,

ASA GRAY.

TO JOHN TORREY.

July 27, 1858.

I have to-day received a nice present from Vilmorin of Paris, i. e., the copy of Robert Brown's "Prodromus," presented by him to A. L. de Jussieu.

. . . I am kept here, too, by the attending suddenly to building a new conservatory, for which a donation of $2,000 has been received. I cannot leave till it is well under way.

I am deep in Japan botany; interesting results.

September 24.

At length we are home again, arriving night before last, very direct from Quebec, where we had (as everywhere else upon our whole route — Litchfield, New York, Palisades, Fairfield, Sauquoit, Montreal, etc.) a delightful time. J. much stronger, except for a cold caught in Quebec, which still lingers.

Colonel Munro[1] was very kind; is a jolly good fellow, as the English say.

TO GEORGE ENGELMANN.

October 14, 1858.

By this time you are in your house, I hope, and all comfortable, and ready soon to set to work.

I rejoice to hear that Mr. Shaw keeps up his zeal, and will make a creditable establishment. I wish him all prosperity. If he will make and keep up a general herbarium it will save you much time and money. . . .

October 30.

I have yours of the 24th. Tatnall[2] is an old friend of Dr. Darlington, new to me, but writing to me of late. I know not his age, profession, character, etc., etc. But he appears to know the plants around him very well. . . .

Hope you are getting settled down and comfortable.

I met Agassiz at the Club. He is cordial and pleasant. He had not heard of your return, which I wondered at. . . .

[1] William Munro, 1816–1880; general in British army. "The most accomplished agrostologist of our day" [A. G.].

[2] Edward Tatnall, b. 1822, Wilmington, Del.; author of a catalogue of plants of Newcastle County, Delaware.

Fendler is with you, at least in St. Louis. Short is ready to advance something if he will fall to collecting again wherever you say. Get him some appointment with the army at Utah. That is the place. What is the good of your both being Democrats if you cannot get something for it!!

December 3.

Darwin asks me to find out if you medical men have ascertained or noticed any difference in liability to take fevers of warm climates, say yellow fever, between light-complexioned and dark-complexioned people of the Caucasian race. If you know personally anything about it, or where anything is published bearing on the point, kindly let me know, and oblige

Your old friend, ASA GRAY.

TO GEORGE BENTHAM.

December 13, 1858.

Boott writes in glowing terms of your paper on British flora and distribution lately read; and I hope soon to read it in the "Linnæan Journal."

That the interchange of temperate species between North America and Europe has taken place via Asia is now a patent fact; and now the whole subject, and the probable explanation, begins to be clear to see.

December 31.

A happy New Year to you and Mrs. Bentham, and many thanks for your letter promising me your paper on Hongkong plants to print here. Pray give me passim any notes that occur to you upon Loo Choo plants, etc. I shall now soon be done with my Japan studies, and shall print a paper bringing to

view curious facts of distribution, etc., and lay out a set for the Kew herbarium. How true it is, as you intimated, that the interchange in northern hemisphere has mainly been via Asia.

I heartily admire your "Handbook," and await with great interest your paper growing out of it; your experience is so great and your judgment so sound. As to English nomenclature, we can only approximate to a good system; the practical difficulties are too great, often insurmountable. It seems to me you hit the happy medium, if we must needs have popular name of the genus coëxtensive with the Latin one; but I rather doubt the advisability of that, and would use sub-generic popular names for generic, I think. Though "I do not much like" the whole thing, yet somebody must attend to English nomenclature, for better or worse; so I am glad you took it up.

I hope you will study perigynous and epigynous. As to ovary, which, putting the important part for the whole, we have learned to use in place of pistil, it certainly is perfectly novel to me to hear the name applied to the gynæcium of Ranunculus. I am confident the word is never so used in De Candolle or Endlicher. I do not recall any instance of your using the word in any such sense; I am sure I never did. Where the fact of the combination is doubtful or ambiguous, if I said ovary, that would infer the combination; if ovaries, the distinctness. In Apocynaceæ A. De Candolle steadily writes ovarium or ovaria, according to the nature of the case. Per contra, you might as well call the column of Malva a stamen! For the collective term, I wish, in your paper, you would go for restoring to use the Linnæan term pistillum, and against the habit of using ovarium in a double sense,

that is, sometimes for whole female organ, sometimes for its ovule-bearing portion. Pray do not add a third; and so when you speak of ovary in Clematis leave us to gather, from the context, whether you mean, (1) the whole gynæcium; (2) a separate pistil; or, (3) the ovuliferous portion of a pistil.

Hooker calls my judgment about root and radicle "a flippant snub"! I beg a thousand pardons, and had no intention to be flippant or dogmatical, but simply to record a fact. For *mistake*, pray read *take*. My thanks for his letter of December 8th; will write him soon.

February 2, 1859.

I wish I had now your paper on geographical distribution, while I am working up the relations of the Japan flora in this respect. Where is Agardh's paper published, and what does it amount to? . . .

I cannot answer Dr. Hooker's exceedingly interesting letter about theoretical ancient distribution of plants this week. Tell him I shall have some evidence which will come well into his views as to north temperate zone.

TO W. J. HOOKER.

January 24, 1859.

I hope soon to hear that Government will acquire your herbarium, and make bountiful provision for its increase and maintenance. After all Brown's genius, you have done more for botany than a dozen Browns, and made a hundredfold more sacrifices and efforts. To you, and to your son, England and the botanical world owe the greatest debt of gratitude, — a debt which I hope will continue to accumulate a long time yet. . . .

TO JOHN TORREY.

January 7, 1859.

My dear Friend, — I will send your bundles presently, after Tuesday next, till when I must work like a dog, to get through the Japan collection, and read a paper on Tuesday at a social meeting of the Academy at Mr. Loring's house that evening (January 11th). Now come on (if by day train), stop there, 8 Ashburton Place, where I will be.

I am going to hold forth for nearly an hour, upon Japan botany in its relation to ours and the rest of the northern temperate zone, and knock out the underpinning of Agassiz's theories about species and their origin ; show, from the very facts that stumbled De Candolle, the high probability of single and local creation of species, turning some of Agassiz's own guns against him.

I introduced it here at Club, last month, and Agassiz took it very well, indeed. . . .

I asked Thurber the name of a couple of Grasses. Let the Grass-man speak ; now that he is turned out to grass, let him attend to his grazing.

February 19.

Andersson writes me that I am chosen one of the six botanists on the foreign list of Stockholm Academy, to fill the vacancy caused by Robert Brown's death.

Friday evening, [April].

I have your two favors of 12th and 15th. I am very grateful for the nice care you take of my wife. You seem to have her under very thorough control.

Cure her up fast as you can, and please return her per railway on the 3d of May ; for the 4th being the

eleventh anniversary of our union, we must not be separated then — "The Union, it must be preserved." . . .

I send back your Cavendish with many thanks.

The old cock was much like Robert Brown in many respects. Though there is nothing in him to love, he calls out a sort of admiration, partly in the literal sense, that is, wonder, mixed with pity, that he had no feelings. Brown had, and besides he was social and not so very queer, but he lived very much in the same way, and I suppose had as little sense of religion.

Schreber spells Anthephora, but gives no derivation. P. de B., you see, does, so Anthephora is doubtless right.

Can that and Buffalo-grass be the same? I doubt. Has the Anthephora-like plant no stamens of its own?

The mode of growth does not so much distinguish your plant from Newberry's Hemitones, and verily I suspect they are the same species. Pity you come in and spoil a good name! . . .

TO A. DE CANDOLLE.

April 27, 1859.

I am charmed at the intelligence you give of your son, and that he takes to botany with spirit, so that he may continue the celebrity of the honored name of De Candolle in the third generation.

We shall welcome him when he comes to America and will do all we can to advance his objects. Oregon and the country to the north of it (British Columbia) will be in good and safe condition to explore, and I am convinced that there is still much to find in the Sandwich Islands, especially in the interior of

Hawaii, where there is said to be a broad, almost untrodden, wooded region, between the principal mountain-masses, and occupying a good part of the interior of the island. But it will take time, patience, and considerable means to explore this region; provisions must be carried in for a long way, and many natives employed in feeding the exploring party. Next, the Kurile Islands, and all the northern part of Japan, Yesso, and the islands northeast of it offer the greatest interest; Manchuria also, but the Russians will look after that; Korea could perhaps be explored, so that the expedition you have suggested strikes my fancy as the best that could be, and would take your son through regions full of interest, safe to explore, and healthy. Certainly I can suggest nothing better.

Pray give my best regards to M. Boissier and to other friends in Geneva. I trust you will have safety and tranquillity in Switzerland. But it appears as if you would have war all around you,— a very sad state of things. Our latest intelligence looks very warlike, I am sorry to see. With all my heart I join in the supplication, "Give peace in our time, O Lord." From such a war as is threatened no good can spring, in any result. . . .

Ever and very cordially yours, ASA GRAY.

TO GEORGE ENGELMANN.

May 18, 1859.

Well, even $10,000 a year is much better than nothing for the botanical establishment. I wish we had half of that. . . .

If Shaw will be liberal in his establishment, why not turn over to him your general herbarium? If I had one I could have free access to always, I would

not take the expense and trouble of keeping up and increasing one myself. . . .

So, you have made the capital discovery, and proved the so-called Anthephora to be the female of Buffalo-grass. I would not have believed it without direct evidence.

I cannot study it; it would take me a long while to get the case so before me that my opinion about the affinities of the grass would be of any use; but it is most interesting, and I beg you to work it out in detail and thoroughly. . . .

June 6.

As to your own herbarium, I think you are right for the present. Keep your own; arrange it on paper of the size of Shaw's. But look to an eventual combination, either in Shaw's lifetime or soon after, and be open to propositions from Shaw; as, for example, to take your whole herbarium, provide for maintenance and increase, and when ready, to make you director of the whole concern. This duty must devolve upon you, and when it does, with a decent salary, you could reside up there, throw physic to the dogs, or only take a share in consultations, and have time to do yourself justice in botany.

Meanwhile, if Shaw would take your herbarium upon proper terms, you might at any time have any particular families of plants with you, in your house, to work at. . . .

Mr. Shaw has lately written. I inclose his letter to you. I have just replied to it, expressing a lively interest in his projected establishment, and offering my best services if he requires them in the way of advice or suggestion. I hope it will be all right in the end. . . .

CHAPTER VI.

LETTERS TO DARWIN AND OTHERS.

1860–1868.

As before stated, Dr. Gray's letters to Dr. Darwin previous to 1862 have been destroyed, save the one dated January 23, 1860, which was published in Darwin's "Life and Letters," and is here reproduced for the convenience of the reader, as well as Dr. Gray's letter of January 5, 1860, to Dr. Joseph D. Hooker, also published in Darwin's "Life and Letters." The original letters to Darwin later than 1862 have been more or less injured, apparently by the ravages of mice, so that in copying them it has sometimes been necessary to supply missing words. Where these are not obvious, the supposed words are enclosed in brackets.

The letters in this chapter also include the period of the civil war; into which, as they show, Dr. Gray threw himself with all his earnestness. He helped as far as he was able in every way. A company of the men who were too old or otherwise incapacitated from going to the front was enlisted in Cambridge to guard the State Arsenal there, and also to be ready to be summoned in any emergency; and he joined the ranks and was faithful in the drilling and every duty to which they were called. It is hard to realize, in these days, how all the community worked together in all possible ways; it was the business of life.

TO J. D. HOOKER.

CAMBRIDGE, January 5, 1860.

MY DEAR HOOKER, — Your last letter, which reached me just before Christmas, has got mislaid during the upturnings in my study which take place at that season, and has not yet been discovered. I should be very sorry to lose it, for there were in it some botanical mems. which I had not secured. . . .

The principal part of your letter was high laudation of Darwin's book.

Well, the book has reached me, and I finished its careful perusal four days ago; and I freely say that your laudation is not out of place.

It is done in a masterly manner. It might well have taken twenty years to produce it. It is crammed full of most interesting matter, thoroughly digested, well expressed, close, cogent; and taken as a system it makes out a better case than I had supposed possible. . . .

I will write to Darwin when I get a chance. As I have promised, he and you shall have fair play here. . . . I must myself write a review of Darwin's book for "Silliman's Journal" (the more so that I suspect Agassiz means to come out upon it) for the next (March) number, and I am now setting about it when I ought to be every moment working the Exploring Expedition Compositæ, which I know far more about. And really it is no easy job, as you may well imagine.

I doubt if I shall please you altogether. I know I shall not please Agassiz at all. I hear another reprint is in the press, and the book will excite much attention here, and some controversy. . . .

TO CHARLES DARWIN.

CAMBRIDGE, January 23, 1860.

MY DEAR DARWIN, — You have my hurried letter telling you of the arrival of the remainder of the sheets of the reprint, and of the stir I had made for a reprint in Boston. Well, all looked pretty well, when lo, we found that a second New York publishing house had announced a reprint also! I wrote then to both New York publishers, asking them to give way to the author and his reprint of a revised edition. I got an answer from Harpers that they withdraw; from the Appletons, that they had got the book out (and the next day I saw a copy); but that, "if the work should have any considerable sale, we certainly shall be disposed to pay the author reasonably and liberally."

The Appletons being thus out with their reprint, the Boston house declined to go on. So I wrote to the Appletons, taking them at their word, offering to aid their reprint, to give them the use of the alterations in the London reprint, as soon as I find out what they are, etc., etc. And I sent them the first leaf, and asked them to insert in their future issue the additional matter from Butler,[1] which tells just right. So there the matter stands. If you furnish any matter in advance of the London third edition, I will make them pay for it.

I may get something for you. All got is clear gain; but it will not be very much, I suppose.

Such little notices in the papers as have yet appeared are quite handsome and considerable.

[1] A quotation from Butler's *Analogy*, on the use of the word "natural," which in the second edition is placed with the passages from Whewell and Bacon, on p. ii., opposite the title-page.

I hope next week to get printed sheets of my review from New Haven, and send them to you, and will ask you to pass them on to Dr. Hooker.

To fulfill your request, I ought to tell you what I think the weakest, and what the best, part of your book. But this is not easy, nor to be done in a word or two. The best part, I think, is *the whole*, that is, its plan and treatment, the vast amount of facts and acute inferences handled as if you had a perfect mastery of them. I do not think twenty years too much time to produce such a book in.

Style clear and good, but now and then wants revision for little matters (p. 97, self-fertilizes itself, etc.).

Then your candor is worth everything to your cause. It is refreshing to find a person with a new theory who frankly confesses that he finds difficulties, insurmountable at least for the present. I know some people who never have any difficulties to speak of.

The moment I understood your premises, I felt sure you had a real foundation to hold on. Well, if one admits your premises, I do not see how he is to stop short of your conclusions, as a probable hypothesis at least.

It naturally happens that my review of your book does not exhibit anything like the full force of the impression the book has made upon me. Under the circumstances I suppose I do your theory more good here, by bespeaking for it a fair and favorable consideration, and by standing noncommitted as to its full conclusion, than I should if I announced myself a convert; nor could I say the latter, with truth.

Well, what seems to me the weakest point in the book is the attempt to account for the formation of organs, the making of eyes, etc., by natural selection. Some of this reads quite Lamarckian.

The chapter on Hybridism is not a *weak*, but a *strong* chapter. You have done wonders there. But still you have not accounted, as you may be held to account, for divergence up to a certain extent producing increased fertility of the crosses, but carried one short, almost imperceptible, step more, giving rise to sterility, or reversing the tendency. Very likely you are on the right track; but you have something to do yet in that department.

Enough for the present.

I am not insensible to your compliments, the very high compliment which you pay me in valuing my opinion. You evidently think more of it than I do, though from the way I write to you, and especially to Hooker, this might not be inferred from the reading of my letters.

I am free to say that I never learnt so much from one book as I have from yours. There remain a thousand things I long to say about it.

Ever yours, ASA GRAY.

TO CHARLES L. BRACE.

1861 (?)

DEAR BRACE, — I should criticise various things in your last "Times" article, if you were here to talk it over with me.

If you expected Huxley to do what you criticise him for not doing, you would naturally be disappointed. His merit, and his way as a lecturer, is to select some good topic or point of view and make a clear exposition of it, the clearness of which very much depends upon his not scattering himself over too much ground. He naturally kept himself to matters he could handle well, and let alone those upon which, as we very well know, he had nothing in particular to say.

1. "Merest fancies," "baseless fabric of a dream," etc.

Why, what made Owen an evolutionist as early as Darwin? And what has made so many naturalists, Mivart, and lately Dana, for instance, evolutionists, who yet think nothing of Natural Selection?

But to illustrate. You allow that the evolutionary pedigree of the horse is made out. But what had "Natural Selection" to do with the making this out?

It would have been all the very same, both the evidence and the ground of the inference, if Natural Selection had never been propounded. There is no evidence how the forms were selected, there is simply the *fact* of the series of forms, which, with other like evidence, brings conviction to most naturalists that one has somehow come from the other. And this conviction is about as strong to those who do not believe "Natural Selection" will explain it, as those who do.

2. Professor Guyot, you mean. Dana avowedly adopts from Guyot.

3. To those who talk or think of necessary evolution, or, like Spencer, deduce it ex necessitate rei, this matter of immense time is very pertinent. I don't think Darwin is bothered by it much. On my way of thinking, it is no bother at all, considering what a deal of time there has been anyway.

4. Do you mean "hybrid forms"? I fail to see what hybrids, that is, mules from the crossing of related species, has to do with it, one way or the other. Nobody (of clear conceptions) supposes new species come from the mixture of other species. That is a way to confuse or blend species, not to originate them.

But there is no "want of hybrids;" there are plenty of them, and they have mixed some few species (dogs, for instance); but they play no important part in the matters you are considering.

"Want of connecting forms in living species," that is to the purpose. Well, as a systematic botanist, I wish there was a *want*. The connecting forms are my *great trouble* every day. You would save me an awful deal of trouble, time, and constant uncertainty, if you would cause them to be wanting!

5. So you will not accept the motto "ex uno disce omnes."

If you admit the horse's evolution as proved, does not that carry an implication of evolution in other lines, of which similar, but fewer steps are known? Or are all evolutions those of cavalry?

CAMBRIDGE, June 17, 1862.

DEAR BRACE, — Thanks for the "World." Who wield its destinies?

It is, I suppose, your article on Darwin, a very good one, for its purpose and space.

Before you too confidently reject the evidence for the existence of man in the diluvial period, just turn over a very impartial and good article by Pictet, — a good judge of such matters, — in the March number of the "Bibliothèque Universelle de Genève," "De la Question sur l'Homme Fossile."

I presume it is in the Astor Library. If it is not, you may tell Mr. Cogswell there might as well not be any Astor Library. Ever thine,

A. GRAY.

CAMBRIDGE, April 22, 1862 (?)

DEAR BRACE, — You are very welcome to such casual criticism as I can offer on your two pages of manuscript.

The general fact of a segregated people (or individuals of an animal species) becoming best adapted to the particular climate, etc., through Natural Selection is clear enough, the best adapted alone surviving in the long run, and the peculiarities transmitted by the close breeding.

But what your statements tend to make out is, not the tendency of a human race to return to its original type, but only the tendency of the causes which produced a certain effect once, to produce it again, the circumstances continuing, — to produce it in the Fellahs as it produced it in the remote ancestors of the Pharaohs.

That is all safe enough. But your case does not prove that unless you make out that the Egyptian race was nearly destroyed by crossings.

I do not know, but I doubt if you can show that, that the crossings were ever enough to modify the Egyptian people, at least the common people, who make up the bulk. Slight infusions, you see, would be worked out. The foreign though conquering race would be less prolific and less enduring than the native, etc., etc. So is it not likely that in the Fellahs you have the representatives of the old Egyptians continued, not reproduced, as your remarks would partly lead one to suppose your meaning?

Besides, once having got a race you must not make too much of climate, to the overlooking of the wonderful persistence of any variety when close bred. See the Jews: the nose remains hooked, etc., under all climates.

Again, in your last sentence. When you *unscientific people* take up a scientific principle you are apt to make too much of it, to push it to conclusions beyond what is warranted by the facts. But, because a particular race has persisted in Egypt, how do you know that it is the only race capable of perpetuating itself?

If there had been a large infusion of different people in Egypt, and if they had exterminated the old race, do you not suppose this would have established itself, perpetuated itself, and that its particular adaptations to the climate would have been different from that of the present race?

If you cut off all future immigration into North America, would the Indians resume possession of the country? or else our descendants become a copper-colored race?

Enough for the present. When you have cracked these nuts, send me, if you please, another sheet.

Ever yours cordially, ASA GRAY.

CAMBRIDGE, July 6, 1863.

DEAR BRACE, — Yours of 20th ult. came just as J. was off for New Haven and I getting ready to go to her aid.

We came back only on Thursday, or rather Friday morning. My hands so full that I could not write to Darwin, to whom I owe a long letter, till to-night. I will now inclose your note.

It would be very like a chemist to think that external influences will explain everything. But I presume he believes that peculiarities are heritable. If he does, then he thinks he can explain, or will be able to explain, the origination of variations. I cannot, that is, to any extent, and do not expect to. When

he will show us how external influences actually worked to change a peach into a nectarine, I will consider his proposition.

If he means by "external influences" whatever has brought about the change, very well. I, of course, allow that every variation has a cause, a physical cause. But it seems to me you may as well say that conception and the production of a normal offspring is the result of "external influences" as the production of an abnormal (variant) offspring.

But there is no use writing at random.

You ask me whether I adhere to my notions before expressed, without at all showing me how they have been impugned.

I should rather expect Guyot to indorse Beaumont; a theological bias would act strongly.

But I rely most on Lartet, Coulon, and Pictet, for the age of deposit. Yet it may still be an open question. . . .

Darwin, on account of his health, has to live away from London, and is a recluse. I give no letters to him, least of all to a lively inquisitive Yankee like Beecher, who would give him a fit of dyspepsia at once, from mere excitement.

I have the Imperial Academy of Sciences of St. Petersburg honorary membership; quite a feather, as they are choice and few. Diploma just come.

Ever yours, A. GRAY.

TO R. W. CHURCH.

May 7, 1861.

It was very good of you to write to me (by your letter of 28th of March) when I believe that a former letter of yours was still unacknowledged by me. Your letters always give me much pleasure.

What you say of "Essays and Reviews" seems to me most sensible and well considered; the best thing I have read about the book, viz., that, "with many good and true things in it, it is a reckless book," and that some of the writers had not taken the trouble to clear up their own thoughts and to form orderly and consistent notions before publishing upon such delicate topics.

I have not yet read the book; have only looked it over, and read some of the criticisms. When I have a few days' leisure in the country, in July, I mean to read it carefully. After the flurry is over, I hope the book will receive the proper kind of handling in England, by the proper men. I wish you would think it in your way to write an essay upon some of the points at issue, upon which inconsiderate views are likely to be taken upon either side.

I confess to a strong dislike of Baden Powell's writings. He seems to have had a coarse, materialistic, non-religious mind; at least, he is not the sort of man I should select to illustrate the delicate relations between religion and science.

I am gratified, also, by your apprehending the spirit and object of my essay[1] on Darwin so much better than many who write to me about it. All it pretends to is to warn the reckless and inconsiderate to state the case as it is; to protest against the folly of those who would, it would seem, go on to fire away the very ramparts of the citadel, in the defense of needless outposts; and, as you justly remark, to clear the way for a fair discussion of the new theory on its merits and evidence. We must use the theory a while in botany and in zoölogy, and see how it will work; in

[1] Reviews of Darwin's *Origin of Species* — *Darwiniana.*

this way a few years will test it thoroughly. I incline to think that its principles will be to a certain extent admitted in science, but that, as Darwin conceives it, it will prove quite insufficient.

As to our country, we have been, as a people, undergoing a steady demoralization for the last fifteen or twenty years, the natural end of which lately seemed to be that we should crumble into decay almost without an effort at recovery. If it had been sought under legal forms and in a less outrageous spirit, I think the North would have consented to the peaceful separation of the cotton States, and we should have prospered by the separation. But it has become clear that there would be no living with such a people as our neighbors would be, so long as they allow themselves (against the better judgment of the best) to be ruled by the political demagogues who now hold sway over them. It is clear we must fight, and we had better do it now, and fight for the integrity of the country and the enforcement of the laws. So we are fairly and justly in it, and we are going to conquer the South. They have appealed to force. They must abide the consequences of the appeal, and, we trust, God will help the right. So you may expect to hear of stirring times here. Ever, with great regard,

Yours most cordially, ASA GRAY.

TO GEORGE ENGELMANN.

January 25, 1861.

The Union is overthrown by a conspiracy which would have been kept within bounds, and soon shut itself up, if the border slave States cared enough for the Union to take hold, or even allow it to be arrested or checked. But no, they must become insane, like

the rest, and help it along. Virginia will not take hold and second Kentucky and Tennessee, fighting nobly by Johnson, Crittenden, etc., declare against treason first, and then arrange terms, which are all ready, all they want, for composing the difficulties.

But Cottondom will not have peace and union, and Virginia, etc., are foolish enough to help their game. That the border Southern States will be the principal sufferers will be only a righteous retribution for their guilt.

If, in fact, we only belong to a partnership which any of the partners can dissolve at will, then the Union is not worth having. We must do the best we can without it, and if Missouri would prosper, she should stay with us.

If peace is wanted, the reasonable proposition, "no more territory to be acquired without a majority of two thirds of the States," would give it. With that you may do what you like, or rather what you can, in the present Territories. No more of the continent is worth having, either for North or South.

Posterity will judge rightly, and Toombs, Cobb, Floyd, etc., will go down to their graves as base, dishonored traitors.

My fighting days are over, anyway. I have had the misfortune to lose the end of my left thumb, by an accident, just at the base of the nail.

May 25, 1861.

I am very glad to hear from you. I believe I have a former letter from you unanswered. Lately I mailed to you some botanical pamphlets, one containing the Xantus California plants.[1] But in these times I had

[1] L. J. Xantus de Vesey. Collected at Fort Tejon in 1857–1859 for the Smithsonian Institution.

not the heart to write you. You have seen your dream of peace policy fall in pieces, and Douglas coming out for the war. You have also seen enough to perceive that under the let-alone policy Missouri also would have seceded, under the same discipline which has been applied elsewhere. In which event, let alone, St. Louis would dwindle to a country village.

No, the first and paramount duty of a country is to protect and preserve itself against destruction. The Constitution and government must be maintained, and treason put down if we are able to do it.

If it can't be done, then, and then only, may we submit to disintegration.

Stick firm to the Union, and Missouri will come out well. I am sorry for the bloodshed at St. Louis. Your population is hard to manage. But Harney, as you say, is doing well, and I expect to see your State soon a loyal one. Even those with secession affinities must soon see their own interests. It is impossible there should be peace, — peace is not worth having till the rebellion, based on a plot formed years ago, is put down.

If you think me belligerent, I am nothing to Agassiz. Of course we shall all suffer severely. But better to suffer in devotion to the Union than prosper in petty fragments.

Enough of this. May God preserve and keep you, and let us hear from you when you can; for we take great interest in you, and know your position is a trying one.

CAMBRIDGE, August 6, 1861.

MY DEAR ENGELMANN, — As soon as I got clear of college work, my wife and I started off (on the 12th

of July) to visit my mother and friends in Oneida County, New York, where we rode and drove about in the fine air, over a most beautiful country, and enjoyed ourselves to the full, to her great advantage; also mine. Then we cut across the State to Pennsylvania, visited the coal region of north Pennsylvania; traveled very leisurely; passed through New York, seeing the Torreys three hours, and so to Litchfield, Connecticut, where Mrs. G. is left, and I am at home, to set to work again, having done nothing in botany except to teach since last April.

Now I am going to set to work as soon as correspondence is cleared off.

I found here also a letter from Dr. Parry,[1] and have named the specimens in both, sending the answer to you for forwarding, also Dr. Parry's letter to me.

He can't miss it if he keeps at work between Denver and Salt Lake, climbing to truly alpine regions as often as he can.

Dr. Hooker sent me last spring a fine cast of a bust of Robert Brown. To-day I have also from him a splendid one of his father, Sir William. Tell Fendler that Mr. Shaw should procure both if possible for the Library of Hort. Bot., Missouri.

What next? A young gardener has found a locality of Calluna vulgaris, covering almost an acre, within twenty-five miles of Boston; a case to add to Scolopendrium, Marsilea, etc., but most of all, striking and unexpected. It grows in low ground, and has every appearance of being indigenous.

[1] Charles C. Parry, M. D., 1823–1890. Born in England, came to America in 1832. Explored and collected on the Mexican boundary, in the Rocky Mountains and in California. Died in Davenport, Iowa, — where is his herbarium.

August 27.

I hope and trust that Frémont will be strong enough to keep the war out of your neighborhood. The citizens of Missouri ought to volunteer in such numbers as to keep the rebels out of the State and keep the State true and firm in the Union. It is the cheapest and most honorable way, and will save property, avoid distress, etc.

This rebellion is certainly going to be put down, no matter at what cost, and property at St. Louis will be worth more than ever yet before you and I reach three score and ten.

November 11.

I think very little of Unionists who have been "made Secessionists" by anything. What matter whether you have one fifth, one tenth, or four fifths Unionists, if they will not fight to put down Secessionists, — they might as well be Secessionists out and out. Maryland and Missouri will not and must not be allowed to secede or to do seceders' work, cost what it will. And it is a great blessing to them that we restrain them. The Union must be preserved; suffering is a very small matter in comparison — all must take their part, and the rebels must suffer hard till they give up. We are only beginning to fight. If Missouri wanted security she should have put down her secessionists herself with the strong hand, at the beginning. So of Kentucky. But she has been forced to find out and feel her duty and her honor, and to act.

God save the Union, and confusion to all traitors.

TO DANIEL CADY EATON.

CAMBRIDGE, October 4, 1861.

Your three parcels and letter of October first have duly come. I believe I never answered your note of August 28.

I can't abide writing letters nowadays. But I think often of you. You are happy in being able to do something direct. I wish I could. Find me a useful place in the army, and I will go at once.

My wife and I have scraped up $550, all we can scrape, and lent it to the United States. I am amazed that people do not come forward with their money — those that can't go to fight. I wish I could do both. . . .

I have to-day a letter from Wright, September 4. He is of late botanizing with more spirit than formerly.

A sailing-vessel is up here for Santiago. I shall write by it, the United States mail by steamer being so interrupted, and perhaps send some publications, newspapers, etc. But I shall leave for you to send the "Flora of the British West Indies," as you suggest. I could not spare my copy. . . .

I hope this taking up of large transport vessels means something, and something prompt and thorough.

Thus far one is sick and sad, so little is done.

I had some hopes that your good father would be put at the head of the Commissary Department. I trust he will get promotion somewhat according to his deserts anyhow. Oh for faithful and honest officers and officials! . . .

TO GEORGE ENGELMANN.

CAMBRIDGE, January 15, 1862.

I do not like to write to you much about the war, and that is much reason why I have not sooner replied to yours of December 9.

My brother-in-law and his cousin are both officers in Burnside's expedition, which we expect will do something.

Mrs. Gray and I send warmest New Year greetings to you and Mrs. E., and hope you may feel all right and country safe in 1863.

February 20.

Bravo for Illinois, to which victory at Fort Donelson is due, and bravo for Tennessee and Alabama full of Union men! Does not your old Union blood rise? Pray, now drop all your let-treason-alone, do-nothing-disorganizing notions, and go in for the country, the whole country, reinstate it first, and then we will all go in and make it what it should be. The ungenerous conduct of England shows what a condition we should be in as a fraction, and she playing off one portion against the other, and bullying both.

I pray Congress to put on taxes, five per cent direct on property and income, and heavy indirect besides. What is property! I would fight till every cent is gone, and would offer my own life freely; so I do not value the lives or property of rebels above my own. God bless you.

May 22.

A most lovely spring here. We all flourish and prosper, and rejoice in the strengthening of our national power, and advancing restoration of the Union,

with hopes of hanging leaders of the rebellion, exiling a good many, and pardoning all the rank and file who will come back with a good grace to their allegiance. If they will not, let them beware! Væ victis to such.

The country is to be kept in the Union. If the people choose to stay, let them, and peace be with them. If they wish to emigrate, very well. The North, aided by immigrating Teutons, has great colonizing power, and we can rapidly settle Virginia, Tennessee, Mississippi, etc.

There, this is enough for the present to rile you.

As to Euphorbias, the published names here must take precedence to unpublished names of Shuttleworth, etc.

Ever your most peaceful friend, ASA GRAY.

TO CHARLES DARWIN.

CAMBRIDGE, October 10, 1860.

Thanks for very interesting letter of September 10. I am much pressed now, or would write a long gossiping letter. The bound copy of "Origin" is just received from Murray. Many thanks. . . .

I believe I have seen a pod or two of Horseradish; but they are rare. Your germinations show curious resemblance of dimorphic-crosses with hybrid-crosses, as shown by Naudin; very interesting and capital points for you.

January (?), 1862.

I imagine it is now universally felt here that if we do not do it [i. e., carry on the fighting] we shall have to eat much dirt; that the establishment of a rival power on our long southern line of the free States, to be played off against us, is not to be sub-

mitted to if it can be prevented at any sacrifice. God help us, indeed, if our honorable existence is to have no better safeguard than the generosity or sense of justice of more powerful nations! As to slavery, the course of things is getting to meet your views, as it is clear must be, if the South continues obstinate. If they give up war they may save their institution in their own States, to have the chance of abolishing it themselves in the only safe and easy way, with time and the gradual competition of white labor. But obstinate resistance will surely bring on wide-sweeping manumission.

You see that we are not going to have war [with England] at present. And it appears that the decision of our government will be as unitedly and thoroughly sustained by the whole people as if it had been the other way; contrary to Mr. Russell's prediction, and to our dear friend Dr. Boott's, who writes about our "mob" in a way he would not if he were here to see. Look at an English mob urging up their government so that they felt obliged to back up their demands, with a menacing force on our borders; and making such a peremptory demand as you justly say, "entirely on Wilkes' acting as judge;" a matter which our government would as promptly concede as yours could ask.

Seemann[1] wrote me that the general belief at the clubs and in the City was that our government wanted to get into war with England for an excuse to give up the South. A pretty idea they must have of our wisdom and discretion! Dear Boott is firmly convinced that we have all along been trying to quarrel with

[1] Berthold Seemann, 1825–1871; editor of the *Journal of Botany, British and Foreign*, etc., etc.

England. The belief here is nearly universal the other way, and those who like England best, and perhaps the coolest and best-informed men, have been more and more dissatisfied as time went on.

What has caused this lamentable state of things, this complete misunderstanding? Plainly this: the secessionists in England have adroitly managed the matter and led public opinion in various lines, but all in one direction, inimical to us; and they did not think it too great a stretch to make John Bull believe that we were insane enough to want an English quarrel. In this they have been ably seconded by a few papers here, mainly by those whose loyalty is deeply suspected, and whose influence is as nothing; which are nearly as scurrilous as the "Saturday Review," with no redeeming ability, and you have the result.

Will the evidence that this mail carries satisfy the English that we want to live in peace with them?

But as to good feeling, I am afraid it is too late to expect that.

We were hurt at first by your putting our rebels on the same footing as a government with which yours was in most amicable relations, — and by the general assumption at once that we were gone past redemption, by the failure to see that the power had gone from the hands of those who were always making trouble with your government in some petty way or other, etc., till I think it is generally believed that the governing influence in England desires to have us a weak and divided people, and would do a good deal to secure it.

I am sorry to say that this is the general feeling; and this is now very much intensified.

The feelings of many are very hostile, and they would like to be strong that they might show it. Those of others, who have been exceedingly fond of England, always defending her when possible, and these are mine, are, that we must be strong to be secure and respected, — natural selection quickly crushes out weak nations; that we have tried long enough to have intimate relations between the governments, or the peoples in general. Naturalists, etc., being enlightened people, can be as intimate as they like; but nationally let each say, "God bless you, and let us see as little of each other as possible," each going our own way.

Well, enough of this.

Some of the representations of us in the English papers would be amusing if they did not now do so great harm. One would think it was generally thought that there was no law and order here, nor gentlemanly conduct, nor propriety of deportment among the poorer and laboring people. I wish you could come and see. As to such things, and as to intelligence, education, etc., I have sometimes thought of the picture one could draw from individual cases. Take one — very confidentially — for I would not hurt a really good fellow by exposing his ignorance of what he might be expected to know. Here we lately had a Cambridge graduate (F. L. S., and godson of an English baronet) who in one conversation let us know most frankly that he had no idea where Quito was, or that there were two houses of Congress in the United States, and was puzzled to know whether Boston, United States, time was faster or slower than that of Greenwich! . . .

February 18, 1862.

Accept a hasty line at the present, when I am busy above measure.

Thanks for the Primula paper, which I have barely looked over.

I do hope that you and the other fourteen of your household are out of bed and done with influenza.

As I have not given you up notwithstanding your very shocking principles and prejudices against design in nature, so we shall try to abide your longitudinarian defection. I suppose it is longitude, and I am sorry to see that there is a wide and general desire in that meridian that we (United States) should fall to pieces. But the more you want us to, the more we won't, and the more important it appears to us that we should be a strong and unbroken power. God help us, if we do not keep strong enough, at whatever cost now it may be, to resist the influence of a country which looks upon the continuation of our steady policy to protect and diversify our domestic industry as a wrong and sin against it. No, no, we must have our own way. But the triumph of the Republicans was the political destruction of the very people who were always making trouble with England, and, if you would only let us and have some faith in the North, we should have been permanently on the best of terms.

What you complain of in the Boston dinner[1] was indeed lamentable; such men should not have talked bosh, even at a little private ovation, and we have reason to know some of them were heartily ashamed of it as soon as they saw it in print. It was immediately spoken of here, by influential people, some of

[1] The dinner after the capture of Mason and Slidell.

whom refused to attend the dinner, and in at least one paper, in a tone like your own. It was really as bad as the speeches of some members of Parliament, and worse because it was foolish.

The fact is, a set of cunning fellows on both sides of the water (but here utterly characterless) have contrived to make both English and Yankees believe that each was bent upon quarreling with the other.

Your thinking of me "as an Englishman" would once have been a compliment, and is what from my well-known feelings and expressions I have passed for among my friends here. Had the North gone on giving in to the South as for years past, I should have been one, at least in residence, just as soon as I could have got out of the country. I thank God, it has been otherwise, and that I have a country to be proud of, and which I will gladly suffer for, if need be. With all its weakness and follies (and I know them well) I go for my country, and to be friendly with those we ought to be on good terms with. I am cured of some illusions. We shall do very well, and the two countries will be on the best of terms when we are strong; till then we must not expect it.

If it is the old question of struggle for life, good feeling has not much to do with it: the weak must go to the wall, because it can't help it. "Blessed are the *strong*, for they shall inherit the earth."

My wife, who is loath to strike you from her books, begs you to make allowances for the people here, who were so very cocky at having caught two such ineffable scamps as Mason and Slidell, whom we have reason to hate with perfect hatred; that they thought of nothing else, and did not mean to be saucy to England. But you have made us sore, there is no denying it. We did not allow enough for longitude.

Her former message did not refer to Boott (though he is unfortunately influenced by longitude; but is a Yankee born), nor to Hooker, who, Gallio fashion, cares for none of these things; thinks us unwise for fighting, I presume; but we perfectly agree to say nothing about such matters. It is odd that you all fail to appreciate that it is simply a struggle for existence on our part, and that men will persist in thinking their existence of some consequence to themselves, though you prove the contrary ever so plain; and will strike or grasp or kick, right and left, in an undignified way sometimes; which the safe and sound bystander, coolly looking on, may not appreciate, not sharing his feelings, telling him the world will get on quite as well without him; yet he somehow does not quite like it.

March 6.

I have your note of February 16, about Melastomaceæ. The test of a good theory is said to be its power of predicting. If your speculations lead you to predict the style curved to one side in Melastomaceæ, and the prediction is verified, that will be a great matter in your favor. Why, you are coming out so strong in final causes that they should make a D. D. of you at Cambridge!

I shall be pleased if I can help you about Rhexia. R. Virginica grows not far from here, and I will set to watching it next summer. But I fear it may not help you, as it is stated in our "Flora of North America" to have "anthers uniform." I see, however, the phrase, "style somewhat declined," in the character; which must be looked to. The character was drawn wholly from dried specimens. I have good details from

fresh ones drawn by Mr. Sprague, but cannot just now lay hands on them.

Freely point out anything else you want looked at. I have now a very zealous pupil, who will be glad to be intrusted with looking up plants and observing.

Ever yours, cordially, ASA GRAY.

There is some jolly science in the "Saturday Review," now and then; as in December 28, p. 665, where we are informed that icebergs "are formed by the splashing of the waves on the coast of Labrador."

Mill being "the greatest logician in England," I send you an American reprint of a specimen of his logic, which I know you will like.

We are very sad here at the death of the president of our university,[1] who had also many warm friends in England.

March 31.

Yours of the 15th came this evening. To-morrow I am busy all day in college (where I began my course this year with lectures on Fertilization, developing your views on orchid-insect fertilization, dimorphism, etc., etc., to an interested class!), so I must drop a line for you into a letter for Boott, for Wednesday's post.

A friend has just handed me Morell's new book, which, looking at psychology from the physiological side, I see brings up several notions which have been turning over in my mind for some years. He is coming out a good Darwinian, I see, and is quite of my way of thinking about design. You see I am

[1] President C. C. Felton.

determined to baptize ["The Origin of Species"], nolens volens, which will be its salvation. But if you won't have it done, it will be damned, I fear. . . .

Things move on here, on the whole, very well.

Yes, I will promise not to hate you; quite the contrary!

Our sensitiveness as to England was the natural result of the strong filial feeling on our part. It was very undignified, I dare say. But I think we are getting bravely over it, and getting really not to care what the Old Country may think or say, so it lets us alone.

As to Rebeldom, there is now hardly any State that we have not got some foothold in.

I do not do so much scientific work as before the war, but still I keep pottering away. From now till July, I can expect to do little besides my college duties. Ever, dear Darwin, your cordial friend and true Yankee, A. GRAY.

May 18.

Yesterday came by post the sheets B – I of your Orchid book.

This evening (Sunday) I have opened the parcel and read introduction and chapter i. What a charming book it is! You are right in issuing it in this form. It would be a sin not to do so.

I fear, though, that no publisher would reprint it here; though I may, on reading farther, conclude to offer it to the Appletons, who should have the refusal. But it will surely be popular in England, where orchids are popular and the species known to most intelligent and educated people. I hope soon to get the other sheets. I am perfectly delighted with

O. pyramidalis, and must extract the whole account of its fertilization for "Silliman's Journal."

Our only orchis, that is, O. spectabilis, I brought last summer from western New York, and planted. I shall in a week have three or four spikes coming into flower, and I will cover one and leave the others exposed. They are in a wooded part of the garden, like their natural habitat. The rest of our Ophrydeæ are Habenarias (Platanthera).

I must recur to your letter about Cypripedium and see what you wanted of it, that is, what observation.

If there be any adaptation, be it ever so pretty, I shall never see it without your direction. What a skill and genius you have for these researches! Even for the structure of the flower of the Ophrydeæ I have to-night learned more than I ever knew before.

TO A. DE CANDOLLE.

CAMBRIDGE, April 26, 1861.

MY DEAR FRIEND, — My duties in the university at this season are very pressing. Besides, we are now opening a war, upon the determination of which our very existence depends, and upon which we are to concentrate all our strength and soul, so I have no time nor heart to write of botany just now. . . .

Ever, dear De Candolle, yours most cordially,

ASA GRAY.

December 16.

We do not often exchange letters now, and in these for us trying times in the United States, though far removed from the actual scenes of war, and not much interrupted in my botanical studies, except by distracting thoughts, I write as few letters as I can. The

unfriendly attitude of England gives us much concern. Were it not for that, it is thought we should soon put an end to our rebellion. But I will not write of such matters now.

July 2, 1862.

No fear about our army, now so great. It is largely composed of materials such as nothing but a high sense of duty could keep for a year in military life. It will dissolve like last winter's snow when no more needed.

While I write, a great battle is in progress, decisive if we gain it and take the rebel capital, simply prolonging the strife if we do not. We can raise at once another army if need be; and yet another. Indeed 300,000 more men are now to be accepted, to recruit our ranks and make a sure thing of the result.

Confident of our cause, we expect confidently the favor of Providence. . . .

What a charming book is that of Darwin on orchid fertilization!

TO CHARLES WRIGHT.

CAMBRIDGE, April 17, 1862.

I am at work in college now, you know, and it is very hard work. This last vacation I had to make a new edition and new additions to my "Manual," etc., and to do it in a hurry, and I have at length, for the first time, found out that I am growing old. In fact I broke down under it, and have injured my health a little. . . . I doubt if I ever recover the spring and vim of former times. But we shall see. . . .

My hard work has got correspondence all horridly behindhand, and determined me to draw in my horns,

and drop a good deal of it. My desk has long been so covered deep with unanswered letters, etc., that I have abandoned it, and now sit over on the other side of the table.

If I sit down and answer a letter right off the day it comes, as I am now doing with yours, and as I do with purely business letters, etc., then it is safe. If I add it to the heap, it is a gone case, and I fear will never be really answered.

Eaton, too, as you know, has been very hard worked, in his father's office.

Well, there is no State now in some part of which the star-spangled banner does not float. Lincoln is a trump, a second Washington, steady, conservative, no fanatical abolitionist. Foote, of your State of Connecticut, is putting down his foot on the Mississippi. McClellan is to fight a great battle at Yorktown. Another bloody battle may be fought near Corinth, Mississippi. New Orleans will soon be ours, please God, and then this wicked rebellion will be done for. I pray God I may live to see the end of it, and the States brought back, quietly if they will, forcibly if they must.

I know it will rejoice your heart to see the thing done. And it will be worth all it costs.

Come now, here is a good long letter for a man as tired as I to write, who has been five or six hours in lecture-room, working hard.

August 1.

Here is a bit of reading for you, — substitute for letters, which in truth I have not surfeited you with lately. Who can write letters in these trying times? . . .

Last spring my health felt pretty seriously im-

paired. But by end of June I was able to diminish my college work a little, and take the rest easier, and so now I feel very much better, more like my old self, and I am beginning to clear off my table that I may get at work again on that everlasting South Pacific Exploring Expedition.

There is a charming book out, by Darwin, on the fertilization of orchids by insects. It will open your eyes to most curious things. I have verified much myself here, and made observations which Darwin regards as very interesting. I send you a copy of the book through Eaton, as a present.

Any observations or notes you make I will send to Darwin.

TO CHARLES DARWIN.

July 2, 1862.

I am glad if my off-hand orchid notes interest you, or prove of the least use. I am daily expecting a copy to send you of my notice of the early chapters of your book. I will continue in the ensuing number. And whatever of the notes I send you seem to you worth touching upon, you have only to indicate them, and send back my memoranda, and I will take them up. But as to Cypripediums, I should like to have an opportunity of examining them (except C. acaule) more at large, and growing.

A week from to-morrow, I expect to be able to leave Cambridge, to go down, with my examination papers to read, to my beau-père's place on the shore, for a few days. Then I will try to look up and bring home living Rhexia Virginica; and also I expect to have a look at Calopogon pulchellus, with its strong bearded labellum. And I hope it will not be too late

to get plenty of Mitchella repens, which my pupils do not bring me in as they ought. I want to see if long-styled stigma and short differ, and also the pollen of the two, as they do in Houstonia, of which I hope I sent you Rothrock's [1] observations. At least I will send when he has completed them.

Precocious fertilization in the bud was much noticed here very long ago by Torrey, in Viola, Specularia, etc., etc., also in Impatiens, about which see my "Genera Illustrata," volume ii. I once mentioned it to you as good evidence of close fertilization. As to pollen-tubes of such, I have no observations of my own, but a memory or fancy that they were shown to me by Torrey. I will ask him, and have him look at Specularia.

As to the French lady's translation and commentary on the "Origin," I am not so much surprised. As I view it, there are only two sides to the main question. Very likely she takes one side in a thorough-going and consistent manner; and either she is right, or I am right, i. e., there is design in nature, or there is not. The no-design view, if one can bring himself to entertain it, may well enough lead to all she says, and we may very much admire how collision and destruction of least-favored brings about apparently orderly results, — apparent contrivances or adaptation of means to ends. On the other hand, the implication of a designing mind must bring with it a strong implication of design in matters where we could not directly prove it.

If you grant an intelligent designer anywhere in

[1] J. Trimble Rothrock, of McVeytown, Pennsylvania, b. 1839; botanist of Wheeler's Survey of the United States Expedition to Alaska; late professor in the University of Pennsylvania.

Nature, you may be confident that he has had something to do with the "contrivances" in your orchids.

I have just received and glanced at Bentham's address, and am amused to see how your beautiful flank movement with the Orchid book has nearly overcome his opposition to the "Origin."

The military simile above leads me to speak of your wonder that I can think of science at all in the midst of war. Well, first, we get used to it. Second, we need something to turn to, and happy are they who, forbidden to engage personally in the war (as I am ever itching to do), have something to turn to. Third, I do not do much, do nothing, in fact, except my college duties now for months, and that is the reason I have time to write to you, and be interested in all your doings.

If you suppose everything is paralyzed and desolate here, and the country greatly put back, read a very sensible letter of an Englishman in the "Spectator" of June 7. It is very just and true. We shall recuperate fast enough, and be better off than ever, as much prosperity as is good for us, and more solid, more independent, more self-contained, which is our great desideratum. Free trade be blowed; we must needs have high duties on imports, and it is better that we should. By these and by direct taxes — the tax-bill just passed — we shall have to pay over largely. Very well.

Just at present our prospects (viz., evening of July 3) are looking badly enough. McClellan has clearly been overmatched and driven to the wall, after very obstinate fighting, with very heavy loss on both sides. Whether it is retrievable with reinforcements, or whether the whole campaign has to be begun again

against Richmond, is not yet clear. Anyway we have got to put shoulder to the wheel anew, and it may be done, we suppose, more easily and far more promptly than last year. All we ask is that Europe shall let us alone.

Enough for to-day.

PROVIDENCE, R. I., July 29, 1862.

No more news in the orchids line. I am making two or three days of holiday, and yesterday I found a few specimens of Gymnadenia tridentata. But the flowers are too small to examine well with a hand lens. If they keep, I will take them back to Cambridge in a day or two and see what to make of them. . . .

As to the country, you will see by this time that we have not the least idea of abandoning the struggle. We have learned only that there is no use trying any longer to pick up our eggs gently, very careful not to break any. The South forces us at length to do what it would have been more humane to have done from the first, i. e., to act with vigor, not to say rigor.

We shall be complained of for our savageness, no doubt, whereas we feel that our error has been all the other way. But the independence, the total indifference to English feeling which you recommended last year, has come at length; now we care nothing what Mrs. Grundy says.

CAMBRIDGE, September 22, 1862.

Your pleasant epistles of August 21 and September 4 are to be acknowledged, with thanks. But I have nothing in particular to communicate, except

our hearty congratulations that your boy and Mrs. Darwin are recovering so well.

Tell Leonard that I was pleased both with his attention in writing and with the ocular proof of his convalescence in his being able so soon to use a pen. His requests shall be kept in view; the five-cent stamp I send now; dare say I shall sometime pick up the thirty and ninety, though I never saw the latter, nor the twelve, twenty, and twenty-four on envelopes (the twenty-four cent he must have already, as it is often used on my envelopes to you).

Bravo for Horace, whose illustration of Natural Selection as to the adders is capital. A chip of the old block, he evidently is.

I told you that Rothrock had gone to the war, and perhaps has already been under fire; probably not. I had intended that next spring he should do up Houstonia more perfectly, and work up this and some related matters for his thesis when he comes up for examination. But all this is broken up by his enlistment. . . .

I have been lazy about all my writing, working all day at dry and dull systematic botany, which you anathematize. But if I get time to turn it over, I will say a few words on the last chapter of your Orchid book. But it opens up a knotty sort of question about accident or design, which one does not care to meddle with much until one can feel his way further than I can.

October 4, 1862.

I have just been reading Max Müller's lecture on the Science of Language with much interest. But perhaps what has interested me most is, after all, his

perfect appreciation and happy use of Natural Selection, and the very complete analogy between diversification of species and diversification of language. I can hardly think of any publication which in England could be more useful to your cause than this volume is, or should be. I see also with what great effect you may use it in our occasional discussion about design; indeed I hardly see how to avoid conclusion adverse to special design, though I think I see indications of a way out.

Depend on it, Max Müller will be of real service to you.

October 13.

I have been so much occupied that I deferred to the last moment to write out my second notice of your Orchid book for "Silliman's Journal." I wrote out Saturday evening what I could, and to-day have finished and sent off my manuscript to New Haven. The greater part consists of a record of some of my observations last summer, very hurriedly penned, and sent off. I trust you will be pleased, and will think that my little contributions cannot be better hatched than under your wings.

I hope that my young correspondent is fast recovering strength. Tell him that I have no more stamps for him yet, but shall pick up his desiderata one of these days.

I have some nice live roots of Cypripedium, two or three species to send you, and mean to send Mitchella.

How Hooker does praise up your book, in the "Gardener's Chronicle!"

CAMBRIDGE, November 10, 1862.

It is refreshing to me that you find the special correspondent of the "Times" detestable.

Your comments upon our affairs always show such a good spirit that you need not fear even my wife's "indignation."

We are sorry that you suffer in England; but you must blame the rebels for it, not us, and your Manchester people should have looked earlier to India for cotton.

You don't see, as you would if here, the total impossibility of coming to any terms of peace with the South, based on their independence. Before that can be they or we must be thoroughly beaten. You can't be expected to see too, what seems plain to me, that you English would give us no end of trouble if we attempt a piecemeal existence. We must be strong enough to keep any Old-World power at bay. Then we shall behave pretty well, on the whole; surely so when the North is dominant and is fairly treated. "Seizing on Canada." What do we want of Canada? When the South was aggressive and making slave States we often looked to the peaceful acquisition of Canada as desirable, as a counterpoise. But when we had "changed all that," — and it is changed, and slavery limited, past all doubt, however the combat ends, — we no longer have use or need of Canada. If we get set up again, we have work enough at home, and our hands full for years; we shall be strong for defense, but weak for aggression. The ill-feeling to England will die out when we are well able to defend ourselves and our home interests.

It does seem that all England wishes us to be weak and divided; perhaps that is good national policy.

But the more that is so, the more necessary it is for us to vindicate our integrity, at whatever cost. Let us have it out now, even at the cost of ten times what it has cost so far.

I never thought anything of American institutions for England. Aristocracy is a natural and needful appendage to monarchy. You work out your own type, and you will liberalize fast enough, and leave us to do ours. We 'll make it do, with some jangling.

I wish we could be shut up, like the Japanese of old, for ten or twenty years, only with a weekly mail from you and Dr. Hooker. Well, well!

Ever yours cordially, ASA GRAY.

November 24.

About Max Müller; surely you can't wonder that the attempt to account for the "first origin of language," or of anything else, should be the "least satisfactory."

The use that I fancied could be made of Max Müller's book, or rather of the history of language, is something more than illustration, but only a little more; that is, you may point to analogies of development and diversification of language, of no value at all in evidence in support of your theory, but good and pertinent as rebutting objections urged against it.

Bishop Colenso's book will make a noise in England; indeed, I have only read the notice in the "Athenæum."

You detest the spirit of the "Times" quoad U. S. The "Athenæum" is just as bad in its little penny-trumpet way, every chance it can get, from the first. Can you be much surprised that we return dislike with interest? But we are pleased to find there are sensible and fair writers, such as Cairnes and Mill.

No, dear Darwin, we don't scorn your joining in the prayer that we daily offer that "God would help our poor country," and I know and appreciate your honest and right feeling.

I see also, from the English papers I read, how you must picture us as in the extreme of turmoil and confusion and chaos. But if you were here, you would open your eyes to see everything going on quietly, hopefully, and comfortably as possible. I suppose we do not appreciate our miseries. We accept our misfortunes and adversities, but mean to retrieve them, and would sink all that we have before giving up. We work hard, and persevere, and expect to come out all right, to lay the foundations of a better future, no matter if they be laid in suffering. That will not hurt us now, and may bring great good hereafter.

I never saw, and have scarcely heard of, Miss Cooper's book you ask after. She is the daughter of the late J. Fenimore Cooper, the novelist. The village she describes must be Cooperstown, New York, in the county adjacent to that in which I was brought up, — a region which, every time I visit it, I say it is the fairest of lands, and the people the happiest.

Oh, as to the weeds; Mrs. Gray says she allows that our weeds give up to yours. Ours are modest, woodland, retiring things, and no match for the intrusive, pretentious, self-asserting foreigners. But I send you seeds of one native weed which, corrupted by bad company, is as nasty and troublesome as any I know, namely, Sicyos angulatus; also of a more genteel Cucurbitacea, Echinocystis lobata (the larger seeds). Upon these, especially upon the first, I made my observation of tendrils coiling to the touch. Put the

seeds directly into the ground; they will come up in spring, in moist garden soil.

My observations were made on a warm, sunny day. I doubt if you have warmth and sunshine enough in England to get up a sensible movement.

My note about them is in "Proceedings of the American Academy," iv., p. 98, reprinted in "Silliman's Journal," March, 1859, p. 277. I must own that upon casually taking them up since, I never have obtained such very good results as upon two days of August, 1858.

Upon gourds affecting each other's fruits, I have made no observations at all. I have only referred to that, as a well-known thing, at least, of common repute here, and then referred to maize, where the soft sweet-corn, when fertilized by hard yellow-corn, the grain so fertilized takes the character of the fertilizer. My note about it is in Academy "Proceedings," vol. iv., I think. You have the volumes (which I have not in reach now), and can find it by the index. It does not amount to much. Nothing on maize I know of except Bonafous' folio volume. I am going to get and send you grains of four or five sorts of maize. About the involucrate form, I wrote in my last.

TO GEORGE ENGELMANN.

CAMBRIDGE, 14th October, 1862.

DEAR ENGELMANN, — Never mind turmoil. It will come out right. I go against the abolition wing, but support the President in his Proclamation.

If the rebels continue obstinate, that is only a question of time. Of that, as a military measure, and of the expediency, the President of the United States is

the sole judge, and in time of war he is to be supported heartily. I myself do not see clearly that the time had come. But I have a notion that the President knows better than I.

As you like Judge Parker, I will send you an article written before the Proclamation came out. You will like it, all but the last part, the bitter end. I would continue the war, if necessary, to the sweeping of all rebeldom bare. And that appears to be the sober sentiment of the country.

If Judge Parker, etc., had let their convention alone, we would have ousted Sumner for a wiser man. But now I fear that Sumner will be returned to the Senate.

You had better in Missouri abolish slavery and take United States bonds in indemnity. You will never do better.

TO CHARLES WRIGHT.

October 13, 1862.

Both Torrey and Eaton speak of having your photograph. You cut me, I suppose, because I am such a poor correspondent! I am afraid I deserve it, but what can a poor fellow do in such times as these? . . .

A fruit, one of a dozen ripened here this season in the Garden, has such a tropical look and taste that it reminded me of you. It is Asimina triloba! Tastes like a rich custard into which a piece of scented soap has fallen. . . .

General Stuart with his cavalry has been cutting all round McClellan's army again. Next time, I expect they will make a circuit as far round as Boston, or at least Connecticut, and carry off the horses. They are more in earnest than we are; but we shall use them up at length.

November 14.

Here I was this afternoon, moiling over your plants, copying out Grisebach's manuscripts for the printer (for the printer won't touch the Dutchy-looking thing; and besides, I have additions to make, etc.), when I just happened to remember that to-morrow is Havana mail, and that I was by all means to write to you to-day. There is still time, so here goes.

First, can't you make some arrangement, while you are at this end of Cuba, to receive a Yankee newspaper by mail; say to the address of Don José Blain, or some Havana address. If you can arrange it that it is not stopped, I will send you papers regularly; say the little "Boston Herald," small, soon read, democratic, patriotic, or others, from time to time. . . .

As to collecting still, I should say, Yes, go on, in a gradual and cheap way, i. e., do not make very heavy outlays, as long as you are in the country; at least till next summer. For we cannot get the war done until late next spring (except in Texas).

If you can do as much for western as for eastern Cuba, it will be a good thing. . . .

Meanwhile I have money enough for you, if you can only get it. . . .

But how can you get it at present rates? Or how can I get it to you? If greenbacks would pass there as here, it would be easy enough.

Is there not some Yankee product that I could ship to you that Blain or Lescaille wants, sewing-machines, agricultural implements, chairs? So we might save the loss on exchange. I will send you anything, from a mouse-trap to a wheelbarrow!

You have a letter from me which must have reached you soon after yours of October 25, saying that my

last was eighty-five days old! Indeed, you ought to have had it then. . . .

TO CHARLES DARWIN.

January 27, 1863.

I have been far too busy to write letters; have been interrupted, too, by visitors, etc. . . .

You "wish to heaven the North did not hate us so." We equally wish the English did not hate us so. Perhaps we exaggerate the ill will in England against us. You certainly over-estimate that of the United States against England, which an influential part of your press exaggerates and incites for the worst purposes. But, after all, after the first flurry, we think and say very little about you, and shall live in peace with you, if you will let us. There should have been, and might have been, the most thorough good will between us. I do not think it is all our fault that it is not so.

In reply to your question: —

If oak and beech had large, colored corolla, etc., I know of no reason why it would be reckoned a low form, but the contrary, quite. But we have no basis for high or low in any class, say, dicotyledons, except perfection of development or the contrary in the floral organs, and even the envelopes; and as we know these may be reduced to any degree in any order or group, we have really, that I know of, no philosophical basis for high and low. Moreover, the vegetable kingdom does not culminate, as the animal kingdom does. It is not a kingdom, but a commonwealth; a democracy, and therefore puzzling and unaccountable from the former point of view.

I have just read De Candolle's paper on oaks and

species, and origin. Well, he has got on about as far towards you as I have. It is clear enough that, as I thought at first, derivation of species is to be the word, and natural selection admitted. The only question is, whether this is enough.

Ever your attached friend,

A. GRAY.

TO A. DE CANDOLLE.

CAMBRIDGE, February 16, 1863.

I am disposed to join issue with you on the question of Linnæus' definition of species. I have long pondered your discussion of the subject in "Géographie Botanique," and still think, on the supposition of the fixity of species (which Linnæus of course had in view), that between "community of descent" and "likeness," the former and not the latter is the fundamental conception in the idea of species. We may test this by inquiring whether of the two can be derived from the other. The likeness, I suppose, is the consequence of the community of descent. But, then, as the likeness is a thing of degrees, and, according to present probabilities, species may have only a relative and temporary fixity, your view will after all have the advantage; and the question of species will come to be metaphysical or logical, rather than natural-historical. The worst of all is that there will remain no objective basis or standard; and species will be what each naturalist thinks best so to consider!

I am pleased to know that the view of my article on the "Memoirs" [1] is well received by you. Read-

[1] "Memoirs of Augustin Pyramus De Candolle," *Am. Jour. Sci.*, xxxv. 1–10.

able articles are very needful, when they can be had, for a journal which, like Silliman's, cannot exist without popular support. I promised an article of sixteen pages of this character; but I intended to enlarge more at the close upon the genius and influence of your father, and cite your parallel with Linnæus as portrayed by Fabricius. But I found that my pages were filled before I was aware of it, and I had to cut short, much too curtly. It left me with a somehow dissatisfied feeling. All your remarks about the difference between the profound and the prolific botanists, I agree to; and I think that both Linnæus and De Candolle had as much genius as Robert Brown. . . .

Well, as to origin of species, you have now gone just about as far as I have, in Darwinian direction, and both of us have been led step by step by the facts and probabilities, and have not jumped at conclusions.

I shall be curious to see Mme. Royer's book; Darwin has spoken of her.

Under my hearty congratulations of Darwin for his striking contributions to teleology, there is a vein of petite malice, from my knowing well that he rejects the idea of design, while all the while he is bringing out the neatest illustrations of it!

Did time allow, I should like to write at large upon these enticing topics. . . .

TO W. J. HOOKER.

CAMBRIDGE, March 16, 1863.

I received this morning a letter from William Short, announcing to me the death of his lamented father, our excellent friend, Dr. C. W. Short, of Louisville, Kentucky, one of our oldest botanists, and one of the

best of men and kindest of friends. He died on the 7th inst., of a typhoid fever, supervening on a severe cold.

I feel the loss very much. Although we never met, he was one of my most valued friends. . . .

He always remembered his former correspondence with you with great interest, and was particularly pleased when, in my letter, I could give him news of you.

His herbarium, upon which he bestowed great pains and considerable expense, is conditionally bequeathed to the Smithsonian Institution.

Our botanical Nestor is Dr. Darlington. A few months since I had a letter from him written in as firm a hand as ever; but now he is prostrated by paralysis, which, however, leaves his mind clear. But he cannot remain much longer with us. Short and Darlington were both hearty and true Christian gentlemen.

April 28, 1863.

Your kind letter of the 6th inst. and the photograph were received with more gratification than I can well express. Both your handwriting and your *carte de visite* show you to be well and strong, and, please God, long may you so continue.

Your face looks fuller than a dozen years ago, and a bit older, it may be, but it recalls your friendly and kindly expression, and is the best substitute I can have for not seeing you again.

What I wrote of our Nestor, Dr. Darlington, as about to be removed from us, has come to pass. The good old man died, after much suffering from a paralysis, on Wednesday last, the 22d, as a newspaper slip has apprised me. He had reached the age of

eighty-one. Unless we continue to rank Dr. Bigelow among the botanists, Dr. Torrey, and even myself, now count among the most advanced in age.

I am most happy to tell you that Dr. Torrey, whom I lately saw in New York, and who last week looked in upon us here for a day, is quite well.

Mrs. Greene is cheerful and busy in carrying out her husband's bequest and desires, in favor of the Boston Natural History Society, to whom he left his herbarium and botanical library.

By Professor George Bond, a colleague and neighbor of mine, our distinguished astronomer, and a most worthy, amiable, and modest person, whom I hope you may see, I sent out to you a photograph of F. A. Michaux and of Adrien de Jussieu, which I thought you might like, and which I have just had made from daguerreotypes which I induced them to sit for in Paris in 1851. Bond will be delighted to see Kew again with its vast improvements.

Ever, dear Sir William, yours affectionately,

ASA GRAY.

TO MRS. THOMAS P. JAMES.

CAMBRIDGE, April 30, 1863.

I had sent some while ago word to Miss Morris that I had a single seedling Darlingtonia, and should like to know if Dr. Darlington was in condition to be interested in it. But she thought the time had passed for that.

His memory will long be venerated. We, at least, shall not forget him.

Twenty years ago he had sent to me his selected epitaph, and had discussed it. It is natural and characteristic. I should take an interest in seeing such

an inscription on his tombstone. But, entre nous, I should not fancy such an one on my own. I should select rather some simple line of Holy Writ, expressive of the Christian trust and faith, such as our friend died in.

I had lately been writing brief notices of several of our botanists, deceased, for the May number of "Silliman's Journal" (as you see, I mail a copy just received); and at the time I felt that they probably would not be published before there would be another and more distinguished name to add.

I shall not wait for the year to come round, but I hope to draw up a brief tribute to his memory for the July number of "Silliman's Journal." So I should be much obliged to you for the dates and other particulars you kindly offer to furnish. I hope that autobiography which you are so fortunate as to possess is of such a character that it may be printed, and that you will give it along with a little memoir from your own pen. It will be quite in your way, and I would rather you should do it than any one else. . . .

By the way, I may as well mention that Dr. Darlington told me that certain letters, etc., of Baldwin's, which he could not print, as they were severe on Nuttall, should come into my possession after his own death. You will probably know if any bundle of papers is left, directed to my charge.

TO CHARLES DARWIN.

CAMBRIDGE, March 22, 1863.

MY DEAR DARWIN, — Argyle's article on the Supernatural, to which you called my attention a long while ago, I never happened to see till to-day, when I have read it through. It is quite clever, not deep,

but clear, and I think useful. I see no occasion for finding fault with him, except in his attempts now and then to direct a little odium against you, which is unhandsome, for his main points are those I hammered out in the "Atlantic," etc.; indeed I see signs of his having read the same. But it is hardly fair of him, after expressing his complete conviction that where the operation of natural causes can be clearly traced, the implication of design, upon its appropriate evidence, is not thereby rendered less certain or less convincing, to go on to speak of derivation-doctrine in a way that implies the contrary.

Of course we believers in real design make the most of your "frank" and natural terms, "contrivance, purpose," etc., and pooh-pooh your endeavors to resolve such contrivances into necessary results of certain physical processes, and make fun of the race between long noses and long nectaries!

March 23.

Dr. Wyman,[1] who is a sharp fellow, tells me that, on the authority of the historian Prescott, the Incas of Peru, for no one knows how long, married their sisters, to keep the perfect purity of the blood. Query: How did this strong case of close-breeding operate? Did they run out thereby? Wyman thinks there is no evidence of it.

If it is true, and the Incas stood it for a long course of generations, you must look to it, for it will bear hard against your theory of the necessity of crossing. If they run out, you will have a good case.

[1] Dr. Jeffries Wyman.

April 11.

You see that, at length, the thing is nearly done, and, to use the expression here, rebeldom is "gone up."

You have long seen, I suppose, that I was right in saying there was but one possible end to the war; also that the continuance for a time or abolition of slavery depended simply on the rebels, — that if they obstinately and persistently resisted, slavery was thereby doomed.

It has been a long, weary, and trying work. But the country has had the needed patience and nerve, and the thing is done, once for all, at great cost, but to immense and enduring advantage.

You are the only Britisher I ever write to on this subject, and, in fact, for whose opinions about our country I care at all.

So I hasten to rejoice with you over the beginning of the end.

April 20.

You asked me to tell you, when I had read it, what I thought of Sir Charles Lyell's book.[1] I have only to-day finished the perusal of the copy he kindly sent me, that is, all but half of the matter on glacial period, which I reserve till I can read it more attentively. Throughout it is a very interesting and to me a very satisfactory book. It is three books: 1. A capital résumé and examination of what we knew about the evidence of antiquity of man; no evidence we had not read of before, but very clearly presented, of course.

2. A treatise on the glacial period. Out of this I have much to learn, and must read it all again carefully; of a part I have not yet cut the leaves.

[1] *The Antiquity of Man.*

3. On transmutation matters. That part of the book I can judge somewhat of, and I declare it first-rate. It is just about what I expected, and is characteristic of the man. I think that you, and Hooker, are unreasonable in complaining of Lyell that he does not come out "flat-footed," as we say, as an advocate of natural-selection transmutation. For, 1st, it is evident that though inclined strongly towards it he is by no means satisfied that natural selection will do all the work you put upon it. 2d, he very plainly implies nearly all you would have him say. And, 3d, he serves your cause (supposing it to be well-founded) quite as effectually, perhaps, by his guarded position, by his keeping the position of a judge rather than of an advocate, and by considering still the case as not yet ripe for a decision.

Very skillfully, too, has he presented the case of transmutation so as to commend it, as much as possible, to us orthodox people. (Huxley, I suppose, whose two books I have not seen, would put it in a way to frighten us off.) Indeed, I think he has shown remarkable judgment and taste, and will have much success in disarming prejudice. And this is all you could ask.

The chapter on language makes the points I supposed would be made, or some of them, but only dips in, leaving more to be said. But this is rather ticklish ground, for, if we are not careful here, you would get the better of us in this field quoad design.

If I had got the book three or four weeks earlier I should have worked in some notice of the last chapter into my review of De Candolle, etc., on Species, in the May number of "Silliman's Journal."

Now please do not think of being ill this spring,

and passing all your valuable time, wasting it, at a water-cure.

I have really, as you see, nothing special to write of this week, and no time to read what I have hurriedly penned.

May 26.

Your letter on heterogeny is keen and good; Owen's rejoinder ingenious. But his dissent from your well-put claims of natural selection to attention and regard is good for nothing except on the admission of the view that species are somehow derived genealogically; and this I judge, from various of Owen's statements, that he really in his heart believes to be the case, and was (as I long ago intimated my suspicions) hunting about for some system of derivation, when your book came down upon him like a thunderclap.

Wyman, here, is greatly pleased with Huxley's book on man's place in nature. I have not even seen it.

Did you ever notice how prettily Iris is arranged for cross-fertilizing by bees, etc.?

Your Linum paper has long been here. But I have actually not had time to read it. I might have glanced at it. But I find it best to read only when I can do so with some attention.

Phyllotaxis: I have no notion in the world why the angular divergences should be of that series of numbers and not of others. Opposite leaves give (decussating) the angles. My puzzle has been to account for this system in cycles in leaves running into the system of decussating whorls in flowers (usually, almost universally). You will see the question by comparing in my "Botanical Text-Book" (not "Les-

sons "), pp. 236, 237, with chapter v., section 1; and you see I have drawn an illustration from it apropos to Falconer's remark. But explaining the obscure by the obscure does not amount to much.

As to national affairs, how quarrelsome you English are. Here are we, cool and quietly occupied with our little affairs, never dreaming of harm from you, and your people are trying their prettiest to pick a quarrel with us, because we do what Historicus says the English have always done and will do again when the time comes, having Lord Stowell to back them! Tell me, who is Historicus in the "Times"? An able and most influential person evidently.

The government of England is now showing sense. Do not wonder that some wild talk is given to the air in this rough country, after what you have heard in the House of Commons, and read in the "Times," etc. Am afraid we shall not like each other for a good while — the nations. But all shows I was right. We must carry out our little job, and hold the United States complete and develop material strength at any cost, or we could not live without eating more dirt than we like.

Boasting nonsense is pretty well knocked out of us by severe discipline and sad reverses, but the determination is stronger than ever.

Time up and paper full. Forgive my maundering, and believe me to be,

Ever your affectionate, A. GRAY.

June, [1863].

I am kept distractingly busy, so look for nothing of any use from me yet awhile.

Your Ohio case of law against marrying of cousins,

I put to my neighbor, Professor Parsons, who had it looked up. He tells me there is no such law at all on the Ohio statute books, nor is there a trace of any law on the subject to be found in the laws of any State in the United States. He doubts if there can really be any statistics which tell on the point, because, first, the marriage of first cousins is a rare thing in this country; second, the United States decennial censuses do not afford any information on the matter; third, nor any of the [state] censuses that he knows of.

Pray, don't run mad over Phyllotaxis! I can't save you, I am sure.

George's "Converging Sines" is the same, perhaps, as what Bravais was after. His memoir may help you (see "Botanical Text-Book," p. 141, par. 248); or, if you want something thoroughly mathematical, consult Neumann, of Berlin, in some paper, which I have no reference to. . . .

I am sorry you do not give a better account of yourself. Be careful and do not work too hard.

July 7.

My last from you is May 31.

I had arranged to reprint most of Bates on Mimetic Analogy in "Silliman's Journal," but my long review of A. de Candolle crowded it out. I then thought of a brief abstract, but have had no time to prepare it. I wrote remarks and arranged long extracts of your Linum paper, and insisted on it for the July number of "Silliman's Journal." But it, too, was laid over, not for anything I had, for I have little in the July number.

I like and agree to your remark that, in Bates's Geographical Varieties, etc., we get about as near to seeing a species made as we are ever likely to get;

and so believing, I think your gradual way more likely than Heer's jumps.

Apropos to Heer, you ask me if it is not impossible to imagine so many and nice coadaptations as we see in orchids being formed all by a chance blow.

I reply, Yes, perfectly impossible to imagine (and much the same by any number of chance blows).

So I turn the question back upon you. Is not the fact that the coadaptations are so nice next to a demonstration against their having been formed by chance blows at all, one or many?

Here lies, I suppose, the difference between us. When you bring me up to this point, I feel the cold chill.

I have been doing nothing but attend to my daily work, and had got so fagged that I really thought I was about to have softening of the brain, or some other breakdown. But a week of respite, caused by the death of an aged relative of my wife's, — a dear old soul, — taking us away from here perforce, has set me up very nearly, and now after a week more comes my vacation, and we are off into the quiet country for three weeks.

A little legacy of about £2,000 to my wife comes in opportunely to relieve us of anxiety for the future. We have no children (which I regret only that I have no son to send to the war), and this with a little income, rather precarious, of about £200 a year would support us in our very simple way, if I were to throw up my place here. But I cannot do that yet. . . .

Look at Impatiens flowers; see if the most fertile "precociously fertilized" ones ever get crossed!

I have asked in three directions for seeds of the Specularia perfoliata. Inclosed are depauperate specimens.

It is pretty to see honey-bees cross-fertilize Locust (Robinia), much as you say of broom. One of my students has been noticing the way bees act on Kalmia.

Now for my best thing for to-day.

An orchid which I missed last year, Platanthera flava, I knew would be curious, for I remembered a strong protuberance on base of labellum, on the median line. I have not time left to describe it now, having been sadly interrupted, but it is pretty, — equal to anything you have yet seen in British orchids. The process turns proboscis of insect either to right or left, where it will slip into an imperfect ring (as seen from above) or deep groove (as seen from before), in which lies the disk, not flat but coiled up, ready to catch proboscis. It is like the eye of a needle to receive the thread.

Perhaps I will send you, or print, a sketch[1] of the thing.

I am waiting for Gymnadenia tridentata to come on.

But the post hour has come.

July 21.

Your latest is of the 26th ult. You need not worry! It never wearies nor bores me to write to you, in the off-hand way I do. I enjoy our correspondence too much to consent to curtail or interrupt it. I learn from you, here in this remote part of the world, a thousand things which I should not otherwise know at all. And you stimulate my mind far more than any one else, except, perhaps, Hooker. So please do not make a fuss, but let me go on in my own

[1] There was a rough sketch of the disk, etc., in the margin.

fashion, and send me your fresh and stimulating letters, whenever you are in the mood of it. I am now in my vacation, and already, having idled and dawdled a week or two, I am as well and hearty as possible, and in the best of spirits. We should leave home this week for three weeks' run in the country, but the sickness of my wife's nephew, Lieutenant Jackson of Massachusetts Cavalry, will keep us awhile, as, though not alarming, it might take a bad turn, and so I may not be in the country for a week or two yet. We shall see. . . .

I have strong and fresh Drosera rotundifolia, and it will now turn in its bristles and stick the viscid gland fast to a fly, binding him fast on all sides with liliputian cords. But it is awfully slow about it, — say three or four hours, and the next day the leaf sometimes becomes involute and folds over or curves around the insect; but what good? If the fly is not stuck fast in alighting, no movement takes place to hold him till he has got away if he ever could. However, it is an indication of what is so effectually done in Dionæa.

Rotary movement of end of tendril-bearing stems is common, is it not, and well-known?

Any notes you will give me to print in "Silliman's Journal," I shall always delight in.

I have been reading Owen's Aye-aye paper. Well, this is rich and cool! Did I not tell you in the "Atlantic," long ago, that Owen had a transmutation theory of his own! It is your Hamlet, with the part of Hamlet left out! But as you say now, you don't so much insist on natural selection, if you can only have derivation of species. And Owen goes in for derivation on the largest scale. You may as well lovingly embrace! Oh, it is rare fun! . . .

I have been so far disappointed in getting no Gymnadenia tridentata. But I still hope for it. I must have it, indeed.

Boott's address is good, chiefly very good. But he speaks of Wyman's paper without having duly considered it. Wyman's experiments are better than Pasteur's, and the results opposite!

P. S. — Papers just in, or rather telegrams, that you in London were daily awaiting and expecting the capture of Washington, etc., and speculating as to whether Jeff Davis's envoys from Washington might not be received at London as a fait accompli. A good deal of little-concealed joy, etc.

Oh, foolish people! When will you see that there is only one end to all this, and that the North never dreams of any other, — the complete putting down of the rebellion. And since 1863 began, it was clear that it would be attended with the annihilation of slavery.

Time was when we should have highly valued English appreciation of the right cause. We have long ceased to care or think about it.

We only wish you had the city of New York. But the sympathizers with secession and riot there have done their worst, and lost their game. The city of New York is the only part of our country which I am ashamed of; and the trouble there is that it is not American. Enough; good-bye. A. G.

September 1.

Your fine, long letter of August 4th reached me up in the country, in my native region, in the centre of the State of New York, rusticating and enjoying ourselves mightily. We were among the people of a thriving region; a well-to-do set; no poverty near us

for miles and miles, i. e., no hardship, except any that a drunken laborer might bring on his family; and I longed to take you out with us in our drives, that you might see a happy and comfortable country, more and more so every year, and perhaps a larger ratio of the population refined to a reasonable degree in feeling and life than I know of in any other part of the world.

I will consider about fantastic variation of pigeons. I see afar trouble enough ahead quoad design in nature, but have managed to keep off the chilliness by giving the knotty questions a rather wide berth. If I rather avoid, I cannot ignore the difficulties ahead. But if I adopt your view bodily, can you promise me any less difficulties?

If your Lythrum paper shall be at all equal in interest to that on Linum, it will be a gem.

As to tendrils, what are Hooker and Oliver (the latter a professor, too) about, and where have they lived not to know anything of them? Everybody must have seen, in Cucurbitaceæ and Passiflora, tendrils reaching out straight for a certain time, and then, if they reach nothing, coiling up from the end. Also the sweeping of stems. . . .

P. S. [To the above?] Three numbers of Boston newspapers recently sent you, two by this mail (in which my good beau-père is again "spiking the English"), please to forward to Reuben Harvey, Esq., Limerick, Ireland.

You are quite out in supposing that hatred of England is increasing, or that there is the least desire to meddle with you, except in self-defense.

My own feelings were very sensitive at first, because I expected better things, and I then deferred much to British opinion. I now do neither, and nothing

strikes me more than the smallness of mind and largeness of gullibility of the British people, as far as I can judge from their press (weeklies, quarterlies, and "Times"). But I do not suppose you will fight us because you dislike us; and so conversely. I suppose I do not see the papers which so abuse England, though I read influential and respectable papers; but from what I do see, I think we receive far more abuse and misrepresentation and unfair usage than we give.

As to the course of the war and policy of our country as to slavery, some day when you turn back to some early letter of mine you will see that I was a fairly good prophet; that the South might have delayed the abolition of slavery by giving up early in the conflict, but that every month of continued resistance hastened and insured the downfall of slavery. That is now doomed, and sure near to rapid death; quick in some places, slower in others, but sure.

Ill-usage of negroes — who make such good soldiers — will soon be unheard of, except with Irish. It will take some generations of American life to breed out the barbarian they bring to the country.

November 23.

The next best thing, of late, is the exposé of Lindsay and George Saunders (the Confederates) by Historicus.

I trust Historicus' previous letters, in which he shows (about the same time my father-in-law's articles on the subject reached England) that it is the duty of a country to see that armed or war vessels are not fitted out, quite irrespective of all municipal law, have produced their proper effect. Something has produced a great effect, and a great change in the idea

of what it was incumbent on the government to do; and nothing can be more satisfactory than the views now taken; and the effect here is excellent. For we are sure that when the right notions once get a lodgment, as they have, England will faithfully carry them through. Lawyers whom I knew here were confident how the law would ultimately be laid down by your courts; but we greatly feared it would be done only after a few more such vessels had got to sea. All will go well now.

The newspaper I occasionally send you is a fair specimen of the influential part of the press here. Such articles as the "Times" likes to cite have far less effect here than you suppose in the determination of events.

TO GEORGE ENGELMANN.

CAMBRIDGE, December 11, 1863.

MY DEAR ENGELMANN, — Our good old friend Von Martius writes me that on the 30th March next, he will reach his fiftieth anniversary of his doctorate. I dare say his friends will commemorate it in Germany. It occurs to me that it would be a good idea for some of us, his friends and correspondents, to compliment him upon the occasion. Suppose you draw up in German a letter of congratulation, etc., to be signed by yourself, Torrey, Sullivant, etc., and forward about the proper time. Send me, with your German circular letter to Martius, a translation in English. . . .

Yes, I will let you work at botany when I guard you.[1] Your botanical work is far better than your politics. But you must swear the President's oath, Proclamation and all!!

[1] Dr. Gray enlisted and drilled with a company raised for service in Massachusetts.

Martius is not a very remarkable botanist, but good; is a genial, philosophical soul (full of Plato, etc.), a good explorer, has worked up the Palms, etc., well, and is a wonderful man for the amount he knows on a vast number of different subjects, — philology, antiquities, philosophy, et id genus omne.

May 3, [1864].

. . . Spring is opening here, but late. From this to July 10, I am engaged in college every day in the week. Also am watching the herbarium building go up, the brick walls of which, if good weather, may be all up this week, and the roof put on next week.

Your circular letter to good Martius was very good, especially in its original German. Thanks. . . .

Never mind if "Sagittaria graminea, Michaux," is applicable to only one form. You had best keep the old name, the more so as that you propose, S. simplicifolia, is "not always correct." We can't let you change a name because you can improve it. Too many can and would play at that game, and less discreetly than you would, and then cite your example!

If Fendler gets tired of bush-clearing, and will come to me this fall, I will give him $500 a year as curator, lodgings, two rooms in gardener's house, which I have reserved; and let him have say three days in the week for himself, if he wants them.

The people are determined to support and reëlect their excellent President Lincoln (what a noble letter that last of his), whether Frémont and the like make a coalition with copperheads or not. It is all the same to us. Lincoln will walk the course. God bless him!

Wright is coming home for a few months this summer.

TO CHARLES WRIGHT.

CAMBRIDGE, September 18, 1863.

What Don José affirms about coast and mountain vegetation being much the same is curious, unlikely, yet you seem to find it so. That bit of coast with all microphyllous and spiny vegetation is also curious.

I am glad you like him for being an abolitionist. Though not very much of an abolitionist myself, at the start, I hope I can fall in with, and welcome, the ways of Providence, when Providence takes the matter in hand, and say Amen. . . .

Well, you are doing well in botanizing, and should finish up Cuban botany while you are at it. And on your return, you and Grisebach should join teams, and do up Cuban botany in a full memoir. You are right to stay till next spring. You are happy in Cuba; you would not be so here. Things in the United States do not go to suit you at all. "Things is working," and in the right way, — but the end must be the total suppression of the rebellion, — the exile or punishment of rebel leaders, the return of the masses to their duty, and they will put things straight. Just what is now going on in Tennessee will go on elsewhere, I suppose. I know only one man in Cambridge that you could talk secesh to. We can correspond very well, and keep cool. But if we were together, during the war, we should get into a row at once. It could not be otherwise. . . .

When the Union is restored (which it is to be, of course, when the rebellion is put down) those who do not love us well enough to resume their duties and privileges have only to take themselves off to some country they like better. The United States of America belongs to loyal Americans. After the war the

country will prosper wonderfully. And the South will get to be something.

December 1.

Things move on.

"The mills of the Gods grind slow, but they grind exceeding fine." Wait in Cuba a year longer, and you may return to a country in which slavery, having tried to get more, has lost all, and as a system is defunct, to the lasting benefit of all parties.

You might now revisit your old Texan haunts, under General Banks's protection.

The November elections show a united North. Peace democracy has made its issue, and is dead. The reëlection of Lincoln by acclamation seems probable, supported by moderate men of all sorts, the extremes of the opposing parties alone going against him. . . .

Merry Christmas to you.

January 21, 1864.

By the steamer of Saturday, which takes this, a good young fellow, Mr. Kennedy, a member of our Senior class, goes to Cuba, to look after business of his father, and, when he can, to botanize, only four or five weeks, that is, in vacation. He is very fond of botany, and bids fair to be a botanist some day, if he does not take to money-making instead. . . .

This war, we think, will be pretty much over next summer; and then, back in the Union, with slavery pretty much nowhere, by the hearty wish of a majority of the people, we may expect a career of prosperity and real advance of the South, such as it has never known. At least we hope so.

TO R. W. CHURCH.

CAMBRIDGE, December 25, 1863.

For ourselves, your letter found us here just on the eve of our month's holiday, a trip to Lake George, and thence to my natal region, in the most beautiful (and the most English-looking) part of the State of New York. . . . My wife was well enough to do her small part in a great fair held in Boston for the United States Sanitary Commission (which has kept the ladies very busy for the last six months), which has just closed, having brought the net proceeds of about $125,000 (it turns out $140,000) for the relief of suffering.

As to our national affairs, I should like now and then to send you such comments or articles as seem to me to throw most light upon our condition. There is little I could say in a letter. I said very early to English friends that if the rebellion were short it might leave things much as they were before (no desirable state), but if long and obstinate, it would cut the knot we were unable to untie and completely destroy the slave system. You see now it is coming to pass, by rather slow but sure steps, and a great blessing it is to be to the South. To the North the war, with all its sad evils, has been a great good, morally and politically. The end is in the hands of Providence, and we humbly wait for it; but there is very little diversity of opinion here as to what, essentially, the end is to be, that is, the complete territorial reinstatement of the Union, and the abolition of slavery. Very sanguine, you think, in England. We must wait and see, and on our part hope and labor.

Now for a little personal matter. I have long been anxious for the safety and final destination of my

herbarium and other botanical collections, which in my house (besides that, there is not room for them) are too liable to destruction from fire. I had offered them, with my botanical library, to our university, if they would build in the Botanic Garden a fireproof building to hold them, and raise a small fund for their support. Recently and quite unexpectedly, a banker in Boston, almost unknown to me personally, has offered in any case to construct the building, and a few friends are taking steps, with good prospects, to raise by gifts a fund of $10,000 for the support of the establishment. When done, I shall feel that my collections, which are most important for North American botany, are secure for the use of future botanists. To secure this I gladly divest myself of the ownership of collections which have absorbed most of my small spare means for the last thirty years, and which are valued at $20,000 or more. . . .

In the council of our American Academy (of which since May last I have been president) we have nominated Dean Milman to the foreign honorary membership vacated by the death of Whately, and Max Müller to that vacated by Grimm. The election has not yet taken place.

Mrs. Gray, with kind regards, joins me in best wishes for the new year to you and yours.

Very sincerely yours, ASA GRAY.

TO A. DE CANDOLLE.

CAMBRIDGE, December 22, 1863.

MY DEAR DE CANDOLLE, — I thank you cordially for your letter of the 13th November, and for the copy of Thury's interesting and curious paper. This I had not seen, neither Pictet's notice. I find it very

interesting, but I do not see how he got a legitimate deduction from the facts given by Knight in the vegetable kingdom to his principle in the animal kingdom. However, that is of small moment if the principle holds. The subject is one which will naturally attract much attention, and which, as you remark, has philosophical bearings. I mean to bring it up, next week, for discussion at our private (social) scientific club in Cambridge.

I thank you also for the good spirit in which you take, as I meant them, my criticisms upon your article on Species, etc. There is no progress to be made upon such interesting subjects without free criticism, because without it we cannot perfectly clear up our own views nor impart them perfectly to others. And especially, since I have so often to criticise the views or writings of persons for whom I have no particular regard, it is pleasant, if only for the sake of impartiality, to criticise those for whom you have the greatest regard and respect. So I particularly like it when I can criticise such a near friend as J. D. Hooker or Bentham, and I believe they like it, too, at least Hooker, who is himself a very free critic. Of course, I know very well that you will be likely to turn all the points I made. The question upon which of the two foundations the idea of species rests, I well know is not to be settled off-hand by any bit of argument. Pray take up the cudgels against me whenever an occasion offers.

As to theoretical views, you and I receive and use them as means, not as ends, and expect to change many of them from time to time. Such especially as relate to origins and causes are the questions which we ask, rather than answers that we receive; and we

put our questions variously according to the leadings of the case at the time. But this is all commonplace and trite.

It is curious to see that Owen, in his Aye-aye paper, has come to adopt Heer's [1] views essentially, of course without the slightest allusion to Heer.

Our civil war goes on slowly, but very surely, toward the destruction of negro slavery; and with all its great cost, we may hope for future benefit in proportion. By the time we have nearly ended our war, it may be that Europe will have its turn again. I hope not. A. GRAY.

TO JAMES D. DANA.

CAMBRIDGE, January 20, [1864].

MY DEAR DANA, — Perhaps you may not know, and I hope you may be as pleased as I was to know, that your article of last summer on Geological Periods is reprinted in full in the "Reader" (of London), with an appreciative prefix.

Cephalization goes on bravely in your very taking article which you have just sent me. I am much struck with it.

In one thing you zoölogists miss it, I think, — in following French customs in dropping the Latin, the vernacular of science, in names. I wish you would write Aphaniptera, etc., which is just as much English after all as Aphanipters, and good for all languages.

Have Englishified contractions for all such names if you will; it is well. But in proposing and formally

[1] Oswald Heer, 1809–1883; born in canton St. Gall, Switzerland; professor of botany at Zurich. "The most distinguished paleontological botanist of our time" [A. G.].

writing of such divisions, etc., pray use the scientific form.

The other course has greatly jargonified zoölogy.

In botany we have always been more dignified. Moreover I detest "larve," though Kirby tried to introduce the word. "Larva" has got to be as English as "phenomenon."

But I dare say most would agree with you.

I like the ring of most of the new technical terms you have coined. . . . Ever yours,

A. GRAY.

TO CHARLES DARWIN.

February 16, 1864.

MY DEAR DARWIN, — Here we are past midwinter, and not being stimulated as of old by your exciting letters, I have not written you a line since Christmas. Not that I have had anything in particular to tell you. I write now to say how very sorry I am that the word or two I get about you from Hooker gives me the idea that you are having an uncomfortable and suffering time, as well as entirely broken off from scientific work. I feel very sorry about it, and do long for better news of you. . . .

I have lately printed a couple of monographs, one pretty big one, of American Astragali. I do not know that they contain anything you would care to see. Yet I think I shall send you a copy presently, through Hooker.

I feel much the loss of dear old Boott, so good, so true a friend, and he was always writing me little notes telling me of all that was going on.

The sentiment of our country, you must see, at least I assure you, has settled, as I knew it would if

the rebellion was obstinate enough, into a determination to do away with slavery. Homely, honest, ungainly Lincoln is the representative man of the country.

A Boston gentleman, at cost of $11,000 or more, is to build a fireproof house for my herbarium, which I give to the university, with my botanical library. A fund of $12,000 is raising to support it, which will relieve me of the expenditure of about $500 a year. But I shall have double care and bother all the coming spring and summer.

Dr. Scudder has gone to Cuba, to attend an invalid, and wishes to examine orchid fertilization, and asks me what in particular he should look at.

Pray get well, dear Darwin, and believe me to be ever, Yours cordially, ASA GRAY.

TO R. W. CHURCH.

CAMBRIDGE, April 4, 1864.

MY DEAR MR. CHURCH, — If you have long ago written your American correspondent off your books, as being a right shabby fellow, he could not complain.

Here is your agreeable letter of January 19th, a most prompt and more than kind response to mine of Christmas, still unacknowledged by me!

The fact simply is that I have been delaying week by week in the hope of being able to announce to you that the subscription for the support of our botanical establishment was filled up. I am sorry to say that this cannot yet be said. The matter has been privately conducted, that is, nothing said about it in the public prints; but the two gentlemen who took the matter in hand have quietly circulated the paper

among their well-to-do acquaintances in Boston, not beginning till late in January, under the idea that the fair for the Sanitary Commission had perhaps exhausted their friends' purses. Since then, far greater and more pressing demands have been made upon the benevolent and the public-spirited, for a variety of good objects; and our affair has gone slowly in consequence.

I have not heard for a week respecting it, but a week ago the sum subscribed was a little less than seven thousand dollars, the greater part in sums of $500 each. The $10,000 is obviously secure, for subscribers of $100 each, yet to be appealed to, may be relied on for a good part of the lacking sum. But it begins to be clearly seen that $12,000 are needed for the capital of the fund, and this, at the present rate, it will take some time to secure.

Your own offer of a small subscription, I can truly say, not only gratified me in the highest degree, as an expression of an interest in our affair which I had no reason to expect, but has already been of use, — has really been as good for us as any contribution you ought to make. For I took the liberty to read that portion of your letter to three or four friends, and their interest in the matter was sensibly quickened and exalted by this evidence of the lively interest in the matter taken by a country parson, far away in England! So pray consider that you have already helped us on, and we are truly grateful to you for your generous proffer. There is, indeed, a strong temptation to accept your kind offer in the fact that, in the present state of exchanges, owing to our paper currency not on a specie basis (one of the sad consequences of our civil war), every pound sterling in

England, in normal times worth only from $4.90 to $5.00, is worth nearly or quite $8.00, so that a contribution of £5 sterling really now counts here for about forty dollars!! So you see how hard it is for me to discourage your kind intentions. But I really feel that the sum which I specified, as the condition of my own gift to our university, is really quite sure, though slower in coming than we had hoped.

As to the building for the herbarium, I have only to state it goes on famously. It is considerably enlarged in plan from what was at first contemplated, and a favorable early spring has allowed of more progress than could have been expected at this season.

The generous donor of the building not only adopted at once the larger plans as soon as suggested, but himself proposed improvements and additions.

The building, the foundations of which are already laid, in the most substantial manner, is 32 by 57 feet, and is connected with my private study in the house I reside in by a neat conservatory 18 feet long, which takes the place of the simple wooden corridor at first intended. The whole will cost Mr. Thayer, the donor, by the contracts, more than $11,000, and is likely, by extras, to reach the round sum of $12,000. And all will be done before the summer is over, we trust.

See how the expression of your interest to me has led me on, to the neglect of everything else I want to write about. . . . I wish to say something about the troubles in your Old World, which, with all its age and wisdom, falls into "difficulties" hardly less grave than ours. I hope poor brave Denmark will not be crushed out of existence. There are English questions which we regard with much attention, ecclesias-

tical and social questions, on which I would fain know what you think. But I cannot write longer now.

Only as to our war, I beg you to believe that we (the earnest thoughtful people and most around us, according to their measure) have acted and are acting from the highest sense of duty, — duty to our beloved country and to humanity; and we keep the full conviction that great and permanent good is to result. Much of the good we see already, and more comes near to realization every day. So we work and trust, and suffer cheerfully. We only wish our views and motives were better appreciated in general in the country and by the people whose good opinion we most value. But even the lack of that appreciation, which is far from universal, is likely to do us good. I am always sure of your thoughtful good wishes for us. But I must break off.

Ever yours most sincerely, ASA GRAY.

TO A. DE CANDOLLE.

CAMBRIDGE, May 30, 1864.

MY DEAR DE CANDOLLE, — I have let your very kind letter of 28th January lie on my desk a long time, always expecting to write soon, but, having been extremely busy with various administrative matters and college work since it reached me, the convenient moment for writing to you has not arrived till now. I inclose a note to my young friend and late colleague, Professor Eliot, which I beg you to send to the poste restante on arrival. I learn from his friends here that he may be expected to be in Geneva about the time this reaches you.

In my note I ask him to call upon you, as a friend of mine. He will of course be unwilling to make any

demands upon your time or attention. But I should like him to see you, and perhaps he might through you pay his respects to the *savans* in his line, notably to De la Rive. Having wife, etc., with him, and little time, his visit will be transient. Eliot is a chemist and physicist, a man of much promise, we think, and a most gentlemanly man. He is a very trusty friend of mine. He has passed the autumn and winter in Paris, studying hard, and will soon return here, bringing the latest news of you. He and his lady companions are just such people as we should like you to know America by.

I should say to you, moreover, that I gave to another colleague of mine, Professor Cooke, a note to you. He is a chemist and mineralogist, is full of research and zeal, a most estimable man.

You know, perhaps, that I have made over (or am to make over) all my herbarium and library to our university, in consideration of a fireproof building made to receive them, and a fund, of moderate extent, raised for the permanent support. . . . During the summer or early autumn, my collections will be transferred to this their permanent home, to my great relief.

It is probable that I shall continue to spend upon these collections all my available means, and I hope they will be of use in the future, as well as safe, which they are not in my wooden house. My own donation is reckoned in money value at about $20,000.

Charles Wright is expected home from Cuba soon, when there will be a new and interesting distribution of his phænogamous plants.

We trust that our civil war is in its last year, that is, if we are victorious, as we hope to be. In that case your American stocks will be all right again.

Nearly all the little I possess is cheerfully put into United States government stocks, where I am well content it should be.

Small countries, which you prefer, would do very well if all were small, but the few large, like England and France, will domineer unpleasantly over the smaller. Just look now at poor Denmark, which has the misfortune to be small, and so is made to suffer! All Scandinavia had best combine, and build up a strong nation. Natural selection is hard upon the weak! However it may be in Europe, you must excuse us for endeavoring to prevent, while we may, even at great cost, the establishment of a European system on this side of the Atlantic; so we must not fail to put down the Confederacy. We shall, after that, in a quiet way, make the French emperor very uncomfortable in Mexico; but we hope that country may yet be a strong power, but not a French power.

Enough of politics! And believe me to be, with affectionate regard, Ever yours, ASA GRAY.

CAMBRIDGE, January 30, 1865.

MY DEAR DE CANDOLLE: . . . This very day, I have received your envoi by post of the neat little article on leaves of Fagus, which I had seen in English dress, and the copy of Heer's address. Many thanks to you. I have received also, and thank you much for it, the "Prodromus," XIV., I. I have this evening read over Heer's address. It is, as you say, capital. It interests me in its proof of the antiquity of the present flora; and I admit that he very neatly puts the case between his view of the production of our species out of the older ones, and that of Darwin. Here it still rests: Darwin has the great advantage of



DR. ASA GRAY IN HIS STUDY

being able to assign a vera causa. Heer has the disadvantage of having no known cause to assign; but he shows that things do not appear to have proceeded as Darwin's theory requires. It does seem as if there were times of peculiar change as well as of great stability. But were this time of change and that of stability simultaneous for the species of a flora? And does Heer allow enough for the species which now occur under many forms, — show great polymorphism. I continually meet with these in the North American flora; in which the dying out of some forms, and their replacing by others, which may well take place in time, would, in effect, just give a change like that to be accounted for. But I cannot say that these varieties come in insensibly, very likely not.

Now, to speak of myself. My summer was much frittered away; the superintending of the new building for my herbarium just preventing any serious study. The autumn was devoted to the removal and rearrangement of plants and books, and to assisting Charles Wright in the collation and distribution into sets of his collections in Cuba for the last three years past; very full and interesting collections, and requiring much care and labor, on account of this distribution being a continuation of former distributions. I laid out into the sets every specimen with my own hands, Mr. Wright adding the tickets and numbers. It was an immense labor, and was finished only at the close of the last day of the year. . . .

I mean to prepare for "Silliman's Journal" a brief and simple notice of the edifice for my herbarium, so I will not speak further of it here; further than to say that I am well satisfied, only I sadly need a curator!

And now, I turn to your letter of September 29, and ask your pardon for having so long neglected it. Your letters, your reflections upon social and political, as well as upon scientific questions, are always very interesting and instructive to me. I regret that I can render so little return in kind. . . .

As to our national troubles, the prospect brightens that we shall end the rebellion and slavery before long. God grant it.

Believe me to be, as ever, my dear De Candolle, very faithfully yours, A. GRAY.

TO GEORGE ENGELMANN.

February 14, 1865.

. . . Wright is here, distributing and finishing up his North Pacific Expedition Collection; . . . will return to Cuba in a month or two, to take a year or two more there, revisit some old parts and explore some new; then I urge Hayti, but Wright seems rather loth.

Rothrock — from northwestern Pennsylvania — is a bright lively pupil of mine for last three or four years, when not serving his country in the army, where he has done good service as private in infantry, and as captain in Pennsylvania cavalry, etc. He had to leave his thesis partly unfinished. But the real credit of all belongs to him. His father is M. D., and he is now studying medicine, attending lectures at Philadelphia. But botany is in him, and will probably come out. . . .

There, I believe this is about all. J. A. Lowell has made a nice present of costly botanical books, of which more anon.

[March 18.]

. . . Rothrock is going with Kinnicutt this week, to Northwestern America, Norton's Sound, etc., to explore on telegraph route close along the Arctic Circle. Any pines there you want? . . .

March 29.

. . . No, Mrs. Gray did not go to inauguration ball. But she has had a good time. Her brother, the general, took her from Fortress Monroe, where she went, up to the front and close to rebel lines; where she had the honor of having a rebel shell thrown at her!

I expect her home again to-morrow.

No, I don't get a curator, and I want one sadly. Yet it is as well Fendler did not come, as it might have been difficult for me to pay him. He, however, is just the man I want here, to take charge of herbarium and garden. . . .

TO W. J. HOOKER.

CAMBRIDGE, April 24, 1865.

Mr. Wright is about to return to Cuba, to have one year more of exploration there, and especially to visit Turquino, the highest mountain of the island, and some other parts which are still promising.

He will now be able — as he is always most ready — to attend to the gathering of seeds of palms, or other seeds, or things you may want at Kew. He has now some good and kind friends in the country, and deserves them, for he is one of the most hearty, single-minded, and disinterested persons I ever knew, as well as an admirable collector; but being rather rough in exterior, he does not like to come into contact with official people, unless properly accredited. But if armed with official instructions to British con-

suls, etc., and so having the means of very promptly turning over, without bother or uncertainty, whatever he may collect for you, I have no doubt you may turn him to excellent account. Perhaps, however, he will not long remain in Cuba; for there is a prospect of getting him attached (nominally, without any emolument) to the United States consulate-general at Hayti, so that he may explore the botany of that island, as he has done that of Cuba. But I doubt if he will keep in the field many years more, or do such hard work as he has done in former years. I wish him to explore Hayti, however, and then associate himself with Grisebach in the production of a Flora Antillana, or at least a Flora Cubensis, if Grisebach inclines to work longer at West Indian botany, after having finished the critical enumeration of Cuban plants (founded mainly on Wright's collections) which he is now occupied with. . . .

It seems like old times to be writing to you. We have the less occasion for direct correspondence of late years, owing to my having such a capital correspondent, as well as a capital friend, in Joseph. I know not how I could get on without him. I look with great satisfaction upon his splendid scientific career, and feel that you must take great pride in it. I rejoice to hear that you are so well and hearty, and at work with vigor, comfort, and success upon the "Synopsis Filicum."

Dr. Brewer[1] sends his regards. He goes this week to New Haven (Yale College), to attend to the opening of his work as professor of agriculture. I was running over his collections, naming and characterizing

[1] William H. Brewer; botanist of the survey of California; professor in the Sheffield Scientific School, New Haven.

the new things, and laying out a set for you of all you could wish. But since spring opened, my college work has been so pressing that all else has been interrupted, perhaps will be in abeyance till near midsummer.

I must not fail to tell you that our good friend Dr. Torrey sailed yesterday for California! via the Isthmus, to return three or four months hence, perhaps overland.

He is a much trusted officer of government, as assayer of the United States assay office at New York, and the secretary of the treasury, knowing that he needs some respite and change, has arranged this trip for him, upon business of the department, by no means of an onerous character.

He has long wished to set eyes upon California, and I am glad he has such a pleasant opportunity of doing so.

TO R. W. CHURCH.

May 1, 1865.

I have long wished to communicate with you, but it is long since I have written any but pressing letters; a large and ever-increasing scientific correspondence and various business matters absorbing all my leisure and powers, as the times and events also absorb our thoughts. You can imagine how deeply we have felt, rejoiced, and suffered during the last month or so.

Well, "treason has done its worst," and rebellion, as an organized power, is essentially brought to an end. Slavery is done away, and we have now the task of establishing a new and better order of things at the South, of replacing barbarous by civilized and

free institutions. A heavy task, no doubt; but the good Providence that has so wonderfully shaped our ways and sustained us thus far, we humbly and confidently rely on to carry our dear country through all its trials.

I doubt if you will have in England a full conception of the profound impression which this last atrocious crime has made,[1] filling the whole land with the deepest and tenderest grief, like that of a personal bereavement; inexpressibly shocking, but never for a moment bewildering the country nor deranging the action of the government. The manner in which both our victories and sorrows have affected the country is most hopeful, and promises the best results. There is much yet to do and to suffer, and there is need of wisdom, patience, and sacrifice in the renovation of our country, and the establishment of free institutions throughout the South, involving as it does the complete reconstruction of society there. But under God's blessing, we expect full success in due time.

As to myself, I can say little now. I am quite overworked at this season, but I hope that hereafter a rearrangement of my work in the university may bring some relief.

I am beginning to enjoy the advantage and comfort of the establishment of my herbarium, and the building quite meets my expectations. The collections are fast increasing; faster than I can take care of them, through the bounty of my scientific correspondents; while Mr. Lowell's donation of botanical books is of the value of about £300.

[1] The assassination of President Lincoln.

November 16, 1865.

Now do not be startled at a letter from me written the very evening of the day in which arrived your pleasant favor of the 1st inst. For to-day I also received the inclosed official letter, which has been lying, I suppose, for want of your address. And so I send it forward at once.

In fact, the fund raised for the support of the herbarium (nearly $11,000) has been till very lately retained in the hands of the gentleman who took charge of raising it, in the form of a good investment, and is now at length made over to the corporation of the university in trust. Your £5 I turned in at the time when exchange was at the highest (i. e., our currency most depreciated), so it figures as fifty dollars, — quite a sum, — and for it, as for the rest of the capital, we get, up to 1881, six per cent per annum in gold, if the United States government lasts. And we now feel confident enough of that.

Your letters are always very pleasant to us, and that of to-day is very gratifying.

Yes, we, too, should not have said this was the way in which we would have had slavery destroyed, — by no means. We wished it by a slow process which would have cost no life, injured no property, but benefited all as it went on. But our misguided Southern brethren would have it otherwise, and so it was. And it is something to be glad of, after all, that it was done in our day, and we think thoroughly. I take a weekly newspaper, the "Nation," which is on the plan of the "Spectator" and the "Saturday Review," etc., but we have few good paragraph-writers, and our best writers will not write. But this paper may interest you, at least in the letters of its corre-

spondent traveling in the South. I post some numbers to your address, and I will send some more if you care to see them. Otherwise the numbers are thrown aside, for I do not keep them.

Even here we have the same sort of liking for Palmerston which the mass of English have, and no better reason to give for it; and we look with a sort of fascinated interest upon Gladstone, and expect to see him premier before long, in a year or two, and we wonder how he will get on in so critical a position as he will be in. Goldwin Smith I met, but saw not very much of. He was in very delicate health. Fraser I did not see, though he was my father-in-law's guest, and was very much liked by all. Both had troops of friends. Mrs. Gray and I were in the country when Fraser was at Mr. Loring's house on the shore.

The short space left on my sheet must be all devoted to an earnest exhortation for you to follow your two friends' example. Come over and see us, and make our quiet house your home, from which you can travel as much as you like and see the country in this interesting phase. Pray think of it seriously. The expense need not be great.

Mrs. Gray, with kindest remembrances, seconds my request, and wishes it extended to Mrs. Church.

Cordially yours, ASA GRAY.

TO CHARLES DARWIN.

May 15, 1865.

Your kind letter of the 19th ult. crossed a brief note from me. I am too much distracted with work at this season to write letters on our affairs, and if I once begin, I should not know where to stop. You have always been sympathizing and just, and I appreciate your

hearty congratulations on the success of our just endeavors. You have since had much more to rejoice over, as well as to sorrow with us. But the noble manner in which our country has borne itself should give you real satisfaction. We appreciate, too, the good feeling of England in its hearty grief at the murder of Lincoln.

Don't talk about our "hating" you, nor suppose that we want to rob you of Canada, for which nobody cares.

We think we have been ill-used by you, when you thought us weak and broken, and when we expected better things. We have learned that we must be strong to live in peace and comfort with England, otherwise we should have to eat much dirt. But now that we are on our feet again, all will go well, and hatred will disappear. Indeed I see little of that.

I must look to the Plantago dimorphism, for, as you say, these plants, fertilized by the wind, would gain nothing by being dimorphic. No dimorphic species grows very near here, nor can I now get seeds of P. Virginica. Perhaps a good look at even dried specimens, under your hints, may settle the matter.

I was exceedingly interested with the Lythrum paper (but had no time to write a notice of it), and I wait expectingly for your Climbing plants. You are the very prince of investigators. We hope presently to make Mrs. Wedgewood's acquaintance.

July 24.

I am reading in snatches your admirable paper on Climbing plants,— as yet only eighty-eight pages of it, and am watching with great interest all the climbers I have at hand. What a nice piece of work you have made of it!

I see you explain and illustrate at length the double turn of a caught tendril. Is it not enough to say that, with both ends fixed, if it shortens, say by the contraction of one side, it must by mechanical necessity turn its coil different ways from a neutral point?

Ere this, Mrs. Wedgewood should be back from Canada, but I have not yet learned that she is so. She was to let me know, and we would have a day on the shore, where Mr. Loring lives in summer, — a pretty bit of country. But it is now too late.

I wish she could have been here on Friday, when we welcomed back our Harvard men who had been in the war, — over five hundred of them, — and remembered those who had died for their country. What a day we had!

Jefferson Davis richly deserves to be hanged. We are willing to leave the case in the hands of the government, who must take the responsibility. If I were responsible, I would have him tried for treason (the worst of crimes in a republic), convicted, sentenced to death; and then I think I should commute the penalty, not out of any consideration for him, but from policy, and for his more complete humiliation. The only letters I have received expressing a desire to hang him are from rebeldom itself, — from Alabama. You see slavery is dead, dead, — an absolute unanimity as to this. The revolted States will behave as badly as they can, but they are so thoroughly whipped that they can't stir, hand or foot, and we are disbanding all our armies, — a corporal's guard is enough to hold South Carolina. Seriously, there are difficult questions before us, but only one result is possible: the South must be renovated, and Yankeefied.

Well, take good care of yourself, and let me know that you are again in comfortable condition.

November 6.

I am very glad to hear from you, and to see half your letter of October 19 in your own handwriting is a good sign. I do hope you may get a comfortable winter, and bring out your next volume without breaking down.

I am pleased that you approve my abstract of your Climber paper, but observe it was only of the first part of your elaborate article. But as to the praise you speak of, I am sure you pay me back with interest.

I lately sent "Silliman" as much more — a large part, indeed, extracts, which I could not shorten — on the Tendril-bearing part of your paper. But Dana sent me the proof, with all my long extracts omitted for want of room. This reduced my article to incoherence, so I begged all to be laid over for the January number, when I hope to have room. I entertained our social scientific club here with your article, and all were greatly interested.

As to climbing roses, they are the strong summer shoots, growing after flowering, which I find frequently running their heads into dark corners of the porch over my door, etc.

That is very curious, but quite what I looked for, that dimorphous species self-fertilized should act like hybrids (sterile or dwarf, etc.).

You must publish these facts in some brief article.

"Stephens" (Stevens) was a New Yorker; is dead, years ago; wrote most amusing and popular travels; in Egypt, as well. Central America was his first and freshest book, but only amusing, as far as I recollect.

So Palmerston is gone. A fine specimen of a John Bull he was, a very typical specimen. We Yankees can't help admiring and liking him, though not for any good he ever did us. But as for his successor, he is a prig, a juiceless stick.

Don't you think Adams pays him back nicely for proposing that they should sit down and rejoice together over the abolition of slavery? Just see how the world has moved. Turn back to Russell's *lecture* to be read to Mr. Lincoln on occasion of his proclamation of emancipation!

Good-by, my dear, good fellow, and recover health as fast as ever you can.

Yours affectionately, A. GRAY.

TO CHARLES WRIGHT.

CAMBRIDGE, June 28, 1865.

I am not going on so any more. A letter from me you shall have. To be sure I have had none from you since you sailed, but that is no matter. College and garden and herbarium work together are enough to drive one mad; but now the college work begins to hold up, and will soon be over. And as to herbarium, Fendler has at length promised to come at the end of the summer and help me — all winter at least, perhaps longer. . . .

Oh, yes! I have yours of "Habana," May 9th, with your shipboard studies on the variations of Chapman and Grisebach. Well, sometimes one wrong, sometimes the other; sometimes a difference as to who the author of a book is, — Michaux, whose name is on the work, Richard, who wrote it incog.

I inclose my last from Grisebach. I am hoping to arrange to have the catalogue of Cuba plants printed

or stereotyped at Göttingen, for the Smithsonian contributions, and have written Grisebach to cultivate his Spanish influence in the view of having that government at length patronize effectively the bringing out of a Flora Cubensis, by Wright and Grisebach.

You owe this letter partly to the general disturbance of an uneasy conscience, and partly to a sudden cold caught by carelessness in hot weather, which unfits me for more driving work. It is getting better. I hope to write you again before I catch a new one.

July 4, Eighty-ninth Anniversary of the United States.

Yours of June 9–21 reached me the very day that I mailed my last missive to you, a good long letter. Here is a fine letter from you, showing how busy and active a man you are. Pretty well for a man of your age to be shinning up palm-trees, and barking your shins. Be careful! Grisebach will take your criticisms all right, no doubt. Yesterday I got the inclosed from him. Very well. Is the Cuban M. Sauvalle? . . .

Dr. Hooker has sent me a specimen of Welwitschia, that queer African tree a foot high, many years old, and with only two leaves, and those all in shreds. . . .

September 5.

. . . Dear, good Sir William Hooker is dead, — of diphtheria, — on the 15th August, six weeks over eighty years. I have no news yet from the family; but learn indirectly that Dr. Hooker is sick, "a gastric affection." I do hope it is nothing dangerous. . . .

Dr. Gray wrote for the "American Journal of

Science" [1] a memoir of his dear friend, Sir William Hooker, in which, after describing his immense labors in publications of so many different branches, he says : —

"Our survey of what Sir William Hooker did for science would be incomplete indeed if it were confined to his published works, numerous and important as they are, and the wise and efficient administration through which, in a short space of twenty-four years, a queen's flower and kitchen garden and pleasure grounds have been transformed into an imperial botanical establishment of unrivaled interest and value. Account should be taken of the spirit in which he worked, of the researches and explorations he promoted, of the aid and encouragement he extended to his fellow-laborers, especially to young and rising botanists, and of the means and appliances he gathered for their use no less than his own.

"The single-mindedness with which he gave himself to his scientific work, and the conscientiousness with which he lived for science while he lived by it, were above all praise. Eminently fitted to shine in society . . . he never dissipated his time and energies in the round of fashionable life, but ever avoided the social prominence and worldly distractions which some sedulously seek. . . .

"Nor was there in him the least manifestation of a tendency to overshadow the science with his own importance, or of indifference to its general advancement. . . .

"To the wide circle of botanists in which he has long filled so conspicuous a place, . . . it is superflu-

[1] *Scientific Papers of Asa Gray*, selected by C. S. Sargent, vol. ii. p. 321; also in *American Journal Science and Arts*, 2 ser., xli. p. 1 (1866).

ous to say that Sir William Hooker was one of the most admirable of men, a model Christian gentleman."

Dr. Gray was appointed by Mr. Peabody himself a member of the "Board of Trustees of the Peabody Museum of American Archæology and Ethnology in connection with Harvard University" when it was founded in 1866. The Hon. Robert C. Winthrop, offering the resolutions in memory of Dr. Gray, at the meeting in 1888, says, "From first to last, as I can bear witness, he was a most faithful and valuable member of our Board; he was always at our meetings and took an active interest in all our work. In 1874, on the death of Jeffries Wyman, he voluntarily assumed the curatorship of our Museum, and did excellent service until the appointment of Professor Putnam."

TO R. W. CHURCH.

Sunday evening, February 25, 1866.

The number of the "Guardian" followed closely upon your note of the 9th instant, and I have just risen from the reading of your review of "Ecce Homo." I knew nothing of this remarkable book, beyond having seen the title. The notice in the "Spectator" had escaped me, or rather, through a change in the order of circulation in our book club, that number of "Spectator" has not yet come round to me. But I have to thank you heartily for calling my attention to it, and especially for sending me your own published and well-considered thoughts of it. I greatly admire your analysis of the book, and what I thus learn of it greatly impresses me. I shall procure it without delay. I long, not only to read it myself, but to put it into the hands of some

friends. Such a production is timely, and will be very useful. I hope the unknown writer will go on, and as he goes on bring out, in the same fresh and untechnical way, all the essentials of Christian belief. Even if he does not, it will have great value as it is; and one will be curious to see how he can fail to raise the superstructure which this foundation seems to be designed to bear. I have long thought it very important that these subjects and the whole range of connected questions need to be treated by a layman from an unprofessional point of view, and quite apart from theological language or conventional modes of thought, say by a lawyer of a judicial turn of mind, or by a physicist or naturalist, who understands and feels the scientific difficulties, and the prevalent state of mind, especially among scientific people, which most divines persist in ignoring.

As soon as I get this book, and have attentively read it, I shall probably wish to speak of it again to you. If I find that it does not receive notice in this country, I will see that attention is in some way called to it. But I should think it likely to attract attention in this country at once.

I have never thanked you for your letter of December 6, and for the hope, faint though it be, that you may come over and see us some day. Pray don't give over the thought, and some day you may chance to bring it about. Cambridge is not a bad point from which to sally forth in little explorations of American life. . . .

We have much anxiety as to what we can do with the South now we have got it; and our President Johnson is not a Lincoln. The breach which has just occurred, and which may cause great trouble, has

been feared for some time; and the blame is to be assigned in part to the indiscretion and impracticability of a few of the advanced Republican leaders. We have survived worse scenes and darker prospects, and shall surmount these troubles, I trust, in time. But here things cannot always be done in the wisest way. . . .

I imagine Earl Russell is safe for a year or two, since no other minstry could well be found to replace him. I should like, before long, to see Gladstone at the helm.

TO GEORGE ENGELMANN.

. . . The small parcel from Andersson [1] has come. From him I have a nice oil copy of the portrait of Linnæus,[2] painted by Madame Andersson.

Chapman [3] is here, excellent, loyal man all through; hates copperheads; is soon going back, so that you can write him at Apalachicola for Junci. I have told him what you are at with the genus.

March 20, 1866.

I have got Mann [4] well installed in Fendler's place, and he is doing well, doing botanical work, too, on his Sandwich Island plants; will bring out an Enum. Pl. Hawaiens. . . .

[1] Johann Nils Andersson, 1821; professor of botany at Stockholm.

[2] The portrait is in the herbarium of the Museum at Stockholm.

[3] A. W. Chapman, b. 1809. Southampton, Mass. Residing at Apalachicola, Fla.; author of the *Flora of the Southern States.*

[4] Horace Mann, 1844–1868. Made large collections in the Sandwich Islands. Wrote "Enumeration of Hawaiian Plants," *Proceedings American Academy*, 1866.

July 30.

Back to-day from a coasting voyage of four or five days, I find yours of 25th instant. . . .

I have promised Clinton [1] I will go to Buffalo, to the meeting reviving the American Association; then back home, to work, by 20th August.

About the Prussian war I think as you do. About domestic matters I have not changed at all my mode of thinking, as I know. But no time for these things. . . .

TO CHARLES WRIGHT.

May 19, 1866.

. . . I am so driven, so distracted. Bless your stars you are not a professor, and president of Academy, and have a botanical garden and no gardener well trained, and have students, and everything. My correspondence all in arrears, and I am getting hardened and don't care. . . .

You know I am always hard pressed and hard worked at this season; and this year it is far worse than ever. Besides the bother of my classes, unusually bothering on the new arrangement, there is a new gardener and a great deficit or rather deficiency of funds to carry on the Garden, so I have to run that concern pretty much myself. And, to crown all, my little new French gardener, in his anxiety over the work, has got into a state of nervous excitement, gets no sleep nights, and if not soon relieved will, I fear, become truly insane. . . . If he continues half crazed, you may expect me crazed next. Then there are some special scientific students working up here, to add to my botheration.

[1] George W. Clinton, 1807–1885; author of *A Catalogue of the Native and Naturalized Plants of the City of Buffalo, and its vicinity.*

So do not you "growl" at me now if you can help it. . . .

Alas, your Algæ will be too late for dear Harvey. He is dying of consumption, and we may hear of the end any day. This is all at present from

Your old, worn-out friend, ASA GRAY.

TO GEORGE BENTHAM.

June 12, 1866.

We have as many asters as we can manage in America, and in the northern hemisphere of the Old World. I pray you keep out at least Australian things if it be possible.

I envy you more and more in being able to devote yourself to systematic botany steadily, without the distraction and sad consumption of time in professional and administrative duties and avocations, which make havoc of the opportunities of most botanists, and make their work which they are able to do far less valuable than it would otherwise be. And you work on with such quiet determination! The lamented losses of the last year or two have already made you the Nestor, though I cannot think you old. I do hope you have a fair number of good working years yet, in which you can make your great experience tell to utmost advantage. . . .

Much against my will, I have this summer to work upon a new edition of my "Manual of the Northern United States Botany," to which there is much to be done. I shall not, however, so recast the work as I should if I could defer it till I had blocked out the outlines of a similar but much larger volume for all the United States of America, and till your "Genera Flora" had been carried much farther.

What do you intend for this summer? A Continental excursion?

Ever, my dear Bentham, most cordially yours,

A. GRAY.

Dr. Farlow, in his memoir in "Proceedings of the American Academy," speaks of the great interest which Dr. Gray took at this time in observing tendrils and climbing plants. The glass corridor then connecting the herbarium and his study was very much occupied by climbers, and notes were constantly taken of times of revolution, etc. He says, "Dr. Gray hardly ever passed in or out of the herbarium without stroking (patting them on the back by way of encouraging them, it almost seemed) the tendrils of the climbers on the walls and porch; and on the announcement that a student had discovered another case of cross-fertilization in the garden, he would rush out bare-headed and breathless, like a schoolboy, to see the thing with his own critical eyes."

TO CHARLES DARWIN.

May 7, 1866.

I am so delighted to get a letter from you, written with your own hand, and to see that you can work again a little.

I have no new facts about the influence of pollen on fruits, nor about influence of grafts.

I have got a little plant of Bignonia capreolata growing here. I punched a lot of holes into the shady side of a lath; the tendrils thrust their ends in; also into a cornice, but did not stay; either the movement of the stem or tendril, or, at length, the shortening of the body of the tendril by coiling, which it does

promptly, brought all away. I have stuck some cotton on to the lath at the proper height for the next pair of tendrils. The tendril near by stuck fast at once, and is beginning to develop the disks, and now the tendril of the other leaf has bent abruptly round, and seized the cotton with avidity. Are there any new observations I can make?

The Fenian scare, we have supposed here, was mainly a plan of certain rogues here to fleece their poor countrymen and women, poor servants and workingmen! Nothing more could come of it. But I sadly fear many here have enjoyed the trouble it has given and the alarm it has excited, especially among our neighbors in New Brunswick, who rather enjoyed our woes two or three years ago.

Yes, slavery is thoroughly done for. We have a bad set to deal with at the South; and holding wolf by the ears is no pleasant nor hopeful occupation, as the temper of the wolf does not improve under the holding. But we shall jangle out of the difficulty in time, even with such a crooked character as our President to deal with also.

Bring out the book on Variation soon.

July 3.

. . . So there is war on the Continent; really a war "for empire," as Lord Russell said our war was. Now our war was a simple necessity; this Continental one a crime, in which all parties participate. I wish, but do not expect, Prussia to be crushed as one result. I wish all her coast could be annexed to Denmark! However, it is no affair of ours, being on the other side of the Atlantic. And when a nation can get strength and power by robbery, it will be likely to rob.

August 7.

. . . You should study Wyman's observations in his own papers. He is always careful to keep his inferences close to his facts, and is as good an experimenter, I judge, as he is an observer. He has a new series of observations to publish. I think that he has not at all pronounced in favor of spontaneous generation, but I will bet on his experiments against Pasteur, any day.

TO CHARLES WRIGHT.

November 23.

You may well complain that I neglect you. But —

1. I had, till now, nothing special to write.

2. I have been daily expecting to hear from Grisebach, and have sheets to send you, or the copies via Westermann. But not a bit of it yet. The conquest of Hanover by the Prussians seems to have annihilated Grisebach.

3. I have been, am so — *busy* is not the word for it. I can't think of any to express it. I suppose that I have now lying by me more than fifty unanswered letters, though I keep answering the most pressing as fast nearly as they come in. But the rest get neglected, inevitably. I read your letters and follow your work in Cuba with interest. I want you to get all the plants you can (but I see not that you can exhaust Cuba), and then come and settle down here, and work up, as you only can, a nice Flora Cubana. That you are bound to do, just as I am to do the Flora of North America. I see some faint prospect that I may yet, and before very long, be able to sit down to it. But you and I are bound to do these two things yet! . . .

The seeds I put loose in this sheet are Cinchona officinalis. Get the tree introduced into your cooler region, that is, the Caffetals of east Cuba, and the tree will be commercially important in time, and you will be a benefactor of your species. Enough for once. Ever your old friend, A. GRAY.

TO GEORGE ENGELMANN.

November 20, 1866.

DEAR ENGELMANN, — Yes, I have a heap of unanswered letters from you. But I have not one moment of time.

I have copy of "Manual" in printer's hands up to Compositæ, and am only now two days ahead; have been only two hours ahead day after day!! It is awful! So much other work too! . . .

If I could get five hundred to one thousand more a year I would at once resign professorship and salary. . . .

I am well, never more hearty; but worked like a coach-horse. I have got my fund raised for the Garden: small, but we have now clear $2,500 or $2,600 a year for Garden.

February 27, 1867.

How much I am indebted to you! No one else who undertakes to help me ever makes out much, at least to save me time and trouble. . . .

I have not time to write details of the little I know about the National Academy. But I have seen enough to make it clear that I should not be taking any more responsibility about it. So last month I sent my resignation. They have put me on the list of Honorary Members. The American Academy is

as much as I want to attend to, and I do my duty to society in looking well after that. . . .

TO A. DE CANDOLLE.

September 10, 1866.

. . . The war near you was sharp and quick. Switzerland is as fortunately placed as any small nation can be, when surrounded by strong ones ; but you see that in this world only strength can be relied on. See what indignity small and weak nations have to suffer. I trust present peace may last to consolidate a new Germany. But if not, you may have to dread a more general upturning on the Continent.

October 21, 1867.

. . . Your analysis of the whole subject of rules in nomenclature I think is sound and lawyer-like, or rather *judicial*, as well as judicious. There are dangers and inconveniences on every side, and good sense and discretion are needed in the application of these as of all rules. . . .

Very faithfully yours, ASA GRAY.

TO GEORGE BENTHAM.

January 21, 1867.

MY DEAR BENTHAM, — Many thanks for your kind remembrance of us in your letter at the end of the year, which reached me only three or four days ago. I avail myself of the first foreign post since to return, with Mrs. Gray's love, our heartiest good wishes to Mrs. Bentham and yourself, and I trust you will be able to keep up yet, for a good many precious years, the steady botanical work which you make so telling. . . .

I have no doubt of the full and entire correctness of the principles you work on; and the Kew Floras and the "Genera Plantarum" will more than anything else determine the public botanical opinion and mode of working for the next generation. But I suspect that there will remain after all a great many monotypic genera (consider how many of the most distinct genera are so, or nearly so); and I imagine it is best to work without prejudice for or against them.

I dare promise I shall be satisfied with all you have done in Compositæ. As to Umbelliferæ, I wish you joy of the job, and do hope you will reduce the genera twenty per cent at least. I never could take the least satisfaction in them. I never could collate our Umbelliferæ with European genera, and I have no clear conception of more than half a dozen of our genera. . . .

Ever, dear Bentham, yours most cordially,

A. GRAY.

TO CHARLES DARWIN.

CAMBRIDGE, March 26, 1867.

This is to acknowledge yours of February 28.

You see I have printed your queries [1] privately (fifty copies), as the best way of putting them where useful answers may be expected. Most of them will go into the hands of agents of the Freedmen's Bureau, etc. Others to persons I or Wyman may know and rely on. I wish I had had them sooner. My crony Wyman has been two months in Florida, but will be home again before I could send to him.

I did not write the article in the "Nation" on Popular Lecturing, though it contains so many things

[1] A set of questions on expression, etc.

I have said over and over that it startled me. Then it hits so many nails square on the head that I should think it could be written only in Cambridge or hereabouts.

It is generally supposed to be written by a person in New York, but I suspect a person near by here, — only suspect. . . .

Yes, Magnolia seeds hang out awhile in autumn, finally stretch and break the threads of spiral vessels. Whether birds eat them I don't know. They look enticing and have a pulpy coat, are bitter and spicy.

Shall I send you more of these circulars?

I shall send to Indian people too.

TO CHARLES WRIGHT.

April 2, 1867.

I sent your twenty dollars to aid the subscription for the starving Southerners. There have been handsome sums raised for them in the Northern States. But I am afraid you must get most imperfect and one-sided statements of the doings of Congress by the tone of your letters, and decidedly need enlightenment. It is the President, not Congress, that needs to learn the Constitution and the laws of the land. And your Southern loyal friends, if you could get voice of them, would beg Congress to take even more urgent steps for their protection and defense by reconstruction. However, things seem to be going on now pretty satisfactorily. The President is sinking into his deserved insignificance, and the leading rebels are coming out decidedly more sensibly than many of their professed Northern friends. And we hope, therefore, that they may begin to give some fair chance to the loyal men of the South to be heard and to get their rights, which

have been indeed shamefully trampled upon by the President and the dominant party at the South. . . .

I have not time to answer all your interesting botanical notes, and can only thank you for them. I hope you will continue to keep well.

Our spring is late and wet. There is still quite a covering of snow in the garden, and we have had a deal of it in the winter, and wretched walking and getting about in every way. Happy you, in the tropics.

You ask who Austin [1] is. He was an old protégé of Dr. Torrey; lives now in New Jersey, and studies Lemnaceæ and Hepaticæ.

. . . You will be more delighted than I am to know that the Democrats have probably carried Connecticut. But I am not much the contrary; for the Republicans are too many in Congress for their own good, or ours, and it secures the defeat of Barnum for Congress; as it should be. . . .

April 8.

I have been having a Sunday's work over your plants.

It grieves my heart and will grieve yours badly when I tell you that your boxes were put under a cargo of wet sugar, which drained into them, and have ruined the collection.

. . . As to specimens to dispose of, say only one half or one third of the whole mass is left fit for it. Oh dear! God grant you patience! Will you have the courage to set to work over again?

I will try next to tell you what is worst.

Ever your disconsolate, A. GRAY.

[1] Coe F. Austin, 1832–1880; especially devoted to the study of Hepaticæ.

TO WILLIAM M. CANBY.[1]

July 8, 1867.

MY DEAR CANBY, . . . I am charmed with what you say of Dionæa, can confirm some of it, and believe all the rest. Never mind the anatomy of the leaf now — little promise from that; but do go on with experiments on feeding, and record them carefully, and publish when ready.

I am going to send your letter to Darwin, who will be delighted, and will probably suggest experiments. He has an eminently suggestive mind.

I suppose you know the slow way Drosera rotundifolia catches flies, doubtless for same purpose, though it can absorb the juices only through its bristles. I always thought it took in only the gases disengaged by putrefaction.

If you don't know the trick of Drosera, which you should study, too, I will tell you, if you write to me at Sauquoit, Oneida County, New York.

SAUQUOIT, N. Y., July 17.

I have here yours of 13th.

If on leaf of Drosera rotundifolia, in good healthy condition, you put a small fly — somewhat crippled is surer — the sticky pellucid glands will hold him fast. By degrees (I have never seen it under ten or twelve hours at least) some of the bristles outside, which have not touched the fly, will turn inward and bring their sticky tip against the insect; later still others and more external ones turn in, and so the fly is bound by many liliputian bands. As it putrefies, I wonder if the leaf merely takes its chance of getting some of the disengaged gases, or whether it reabsorbs

[1] William M. Canby, of Wilmington, Delaware.

the clear fluid of the glands, charged now with some animal matter.

In transplanting some Drosera into a pan with wet moss, the older leaves may not work well; but the new ones developed soon will do better. Pray experiment upon this and Dionæa. I wonder if there ever were series of intermediate states between the inefficient Drosera and the expert Dionæa. . . .

August 21.

. . . I inclose half a letter which came from Darwin this morning. I hope you will go on with work on Dionæa. . . .

C. DARWIN TO A. GRAY.

(Half of letter referred to above.)

DOWN, BROMLEY, KENT, August 8.

MY DEAR GRAY, — I have been glad to see Mr. Canby's interesting letter on Dionæa, and I thank you for sending it; but unfortunately the facts are not new to me. Several years ago I observed the secretion of the "gastric juices" and the close adhesion of the two sides of the leaf when a fly was caught. I keep my notes in such an odd fashion that it would take me some time to find them. I am almost sure I ascertained the acid reaction of the secretion and its antiseptic power, but I cannot remember whether in this, or in analogous cases, I found its subsequent reabsorption. This letter fires me up to complete and publish on Drosera, Dionæa, etc., but when I shall get time I know not. I am working like a slave to complete my book.

TO GEORGE ENGELMANN.

July 6, 1867.

. . . Well, I have been free from much college work for ten days, and am quite free after Wednesday morning.

I seem as well as possible, bright and clear, and should be content just to visit my old mother and come right back to work on Californian plants, which I have been looking at for a few days. But my wife says I shall take four weeks, and on being weighed I find that my former 140–143 lbs. is reduced to 131.

So I must waste time and money in traveling, which I am reconciled to, as Mrs. Gray needs it much.

From Oneida County, New York, I am going (with Mrs. G.) to drive into northwest and central Pennsylvania and then visit a sister in Michigan. Mrs. Gray insists that we must go to Chicago, which she wishes to see, though I do not. I hate towns, especially new ones. Only think how near I shall be to you!

So you saw old Bigelow, who is quite delighted with Shaw's grounds, etc.

Torrey has just made me a little visit. Good, kind soul he is. . . .

August 15.

We got home three days ago. Hot weather broke down my wife's courage, as I feared, and we went no farther west than Tecumseh, Michigan; made a short visit to Sullivant at Columbus, then meandered through west and north of Pennsylvania to central New York again, and hearing of Mrs. Gray's father's illness came rapidly home. . . .

I am very well; have put on three pounds' weight.

We must go and see you and all the great West at some proper season, spring or late fall. . . .

I germinated for two years Nelumbium, but soon lose them. If you can, send me some seeds this fall to try once more. . . .

TO GEORGE BENTHAM.

October 14, 1867.

. . . Yes, I did receive your address,[1] read it hastily, and sent it to "Silliman's Journal" to be reprinted. It was too late for the September number, but will be the leading article in the November number. I have read a proof and am daily expecting a printed sheet, which I can send to you, with one or two little remarks. I was exceedingly pleased with it; so is Professor Henry. We both wondered how you could have so exactly hit not one, but several nails on the head, as you have done. It will be much read here, and will be truly useful.

You remind me that I ought to have criticised your working of Australian Compositæ. The trouble is, that, except North American genera, these things have long been quite out of my head. It will be unsafe for me to approve or otherwise till I can get at work a little over them, which it is not likely I can at present. I just fancy that in your dislike of monotypic genera — which you abhor as nature does a vacuum — you may have lumped up the angiantheous genera rather too much.

I am straining every nerve to get into a position to get at a synopsis of North American plants, and my present work upon Bolander's collection is a part of

[1] Presidential address by George Bentham, meeting of the Linnæan Society, May 24, 1867.

the preparation. But I cannot lay the corner-stone till college work is over, next July. Meanwhile I want suggestions as to form, and how to condense references to the utmost and crowd a page, yet leaving it clear and comely. When I have got the thing blocked out, and have worked up a part, then Mrs. G. and I hope to go over and see you, and to stay a good long while. Adieu, till next week.

Ever yours, A. GRAY.

TO R. W. CHURCH.

December 5, 1867.

Before the year closes I mean you shall have a note from me, to renew on my part an intercourse which has been interrupted through negligence of mine. I find I get more and more overloaded as I grow older, and I dare say you find it the same. Still we must exchange a word now and then.

I have to tell you of the severe loss we have had in the death, in October, of Mrs. Gray's good and kind father, Mr. Loring. He and my wife were very much to each other, and in former years had been unusually intimate companions; and his death at seventy-three, quite unexpected till within a few weeks of the event, is very much felt. Mrs. Gray's own health, too, is but poor, though on the whole I trust it is becoming firmer.

If you see your friend Mr. Fraser (whom I, unfortunately, did not) you may learn from him what manner of man Mr. Loring was. I wish I knew him, to say to him how highly we value a letter he lately addressed to Mrs. Loring, and which I read yesterday, — so full of sympathy and just appreciation.

Mr. Fraser, you may be sure, is very much thought of here.

I hope that Dr. Hooker, of Kew, has sent on to you the numbers of the "Nation," which I have for a year or more regularly posted to him, originally requesting he should do so. But it is quite likely the busy man has forgotten all about it.

For myself, I have passed my fifty-seventh anniversary, in firm health, feeling my age only in a treacherous memory — as respects names, etc., not as to events or friends. The memory of our delightful visit to Oxford is ever fresh.

TO CHARLES DARWIN.

February 24, 1868.

The other evening here I discoursed at our private club, by giving them an abstract of the chapters on Inheritance and Pangenesis; the former for Professor Bowen's benefit. He and Agassiz took it all very well; and pangenesis seemed to strike all of us as being as good an hypothesis as one can now make. . . .

On inside of leaf of Dionæa see the copious glands for secreting gastric juice.

. . . I do not wonder at your book[1] being taken up at once, by the great numbers of people who need and understand it, and the thousands who jump at anything written by so notorious a writer as you are. The "Origin" will sell anything; and I believe people will get more for their money in this book than in even that, if they care for facts, which generally they do not.

[1] *The Variation of Plants and Animals under Domestication*, by Charles Darwin: London, 1868. Republished by *American Agriculturist:* New York.

May 25.

I want to write you a long letter, but the time is not to be had now. Many thanks for yours of May 8.

My notice of your book in the "Nation" was not intended to have anything in it, except for the groundlings; was only to make the book known and understood, a light affair.

My preface was written at the publishers' request simply because yours had not come. The fellows put in both. The edition is not very nicely printed. Judging from the newspaper notices I think the book is taking famously. That agricultural newspaper is taken by the hundred thousand in the country. As to close of my article, to match close of your book, — you see plainly I was put on the defense by your reference to an old hazardous remark of mine. I found your stone-house argument unanswerable in substance (for the notion of design must after all rest mostly on faith, and on accumulation of adaptations, etc.); so all I could do was to find a vulnerable spot in the shaping of it, fire my little shot, and run away in the smoke.

Of course I understand your argument perfectly, and feel the weight of it.

We were intensely amused at the Edinburgh man, who suggests that I could easily smash you into little pieces! I wish he may live to see it done!

I am half dead with drudgery, half of it at least for other people; see no relief but to break up, and run over, with wife, who needs a change, to your side of the water for a good long while.

TO R. W. CHURCH.

June 22, 1868.

I have to send you — in a hasty line — my best thanks for remembering me so kindly: 1. In your letter of January 17, which I am so tardy in responding to.

2. The copy of Hooker edited by you, which I was pleased to have.

3. Your sermon at St. Mary's, which Mrs. Gray and I both read with much interest. I admired your handling of an important topic, and the solid strength which comes from moderation of statement. It reminded me much of one of our best sermonizers here, who, though a good deal heterodox (I am sorry to say), treats such subjects more impressively than any one else and much in that way, his guarded understatements or concessions telling heavily in the argument.

I read and think of nothing but botany of late, having been too hard pressed for a long while. But last Sunday I read with interest the latter part of Mr. Gladstone's essay on "Ecce Homo."

There is something which seems to me very admirable and attachable about Gladstone. I wonder if his church friends and supporters will mostly drop him at the coming struggle, for his action looking to the disestablishment of the Irish church.

But the gist of my present note is to say, that I have got a year's leave of absence, and Mrs. Gray and I expect to cross over to England in two months.

I find I must break up a set of engagements and of work, mainly for others, which absorbs too much of my time, and Mrs. Gray's health makes me anxious to avoid another winter here, at present. The change

will be good for us both. We mean to pass the whole autumn in England, mostly at Kew, and most of the winter in Italy and perhaps Egypt, where Mrs. Loring, now on the Continent (tell Mr. Fraser), expects to be, and we may be able to join the party, in a climate which may be advantageous after such a winter as our last. Very sincerely yours,

ASA GRAY.

CHAPTER VII.

TRAVEL IN EUROPE AND AMERICA.

1868–1880.

Dr. Gray made his fifth journey to Europe in the fall of 1868. He landed in September, and went at once to Kew, where he remained most of the time at work in the herbarium until November. He made a short round of visits, first to Mr. Church, who was then rector of Whatley, a village of Somersetshire, where, with Mrs. Gray, he enjoyed to the full his stay in one of the loveliest parts of rural England. They went also to Down to pay a visit to Darwin, and with them went Dr. and Mrs. Hooker, with their two eldest children, and Professor Tyndall. Those were days never to be forgotten. In November, Dr. and Mrs. Gray joined some family friends in Paris, with whom they went to Egypt and passed the winter on the Nile, taking the longest vacation, Dr. Gray said, he had ever enjoyed. Upon their return they passed through Italy, Switzerland, and Germany, where old botanical acquaintances were renewed, and some persons seen whom he had known only by correspondence. In England he again worked at Kew, and repeated the visits at Whatley and Down, sailing for America, November 9, 1869.

TO A. DE CANDOLLE.

DOWN, BROMLEY, KENT, October 29, 1868.

In all these busy days I have neglected your kind letter of October 6, partly in the expectation that I might be able to announce to you definitely the time we should reach Paris. I can even now only say that we expect to be there between the 15th and the 20th of November, and I think we shall have just about those days (15–20) in Paris. If we can meet, very pleasant it will be; but I dare hardly expect it. My own and Mrs. Gray's parcels for you shall be left at Masson's in case we do not see you. I am making, with Mrs. Gray, a pleasant week of holiday, most of it here with Mr. Darwin, whose health just now is, for him, remarkably good.

I mean to keep you apprised of our movements; and we may, by some nice adjustments, meet in Germany. At least, and best of all, in Switzerland, which we shall be likely to reach at midsummer. But I have matured no plans for anything beyond the winter. . . . I should like to visit Montpellier and to see Planchon, but we shall, when we reach the Mediterranean, be attached to a party, time will be short, and our movements no longer free.

Bentham is working at Kew with his accustomed regularity and diligence. Hooker's time is much occupied with matters of administration. . . .

It must be a great satisfaction to you, that your son not only takes to botany, but shows so great talent. I hope the line may not fail, but that De Candolle botanists may flourish in the next century as they have in the nineteenth. . . .

The death of Horace Mann, mentioned in the next

letter, Dr. Gray felt as a great personal loss, as well as a loss to science. He was a young man of much promise, and he felt on leaving home that, in putting him in charge of the herbarium and of the college classes, he could not have made any arrangement more promising and satisfactory. He had counted much on his future help as assistant, and anticipated that he would become a very valuable aid in carrying on his work, for he had patience, conscientiousness, and steady diligence. Mr. Mann's lungs were weak, and his health required care, but nothing of immediate danger was feared. But consumption developed rapidly, and he died after a few weeks' illness.

Charles Wright was also working at Cambridge, and took charge of the herbarium and garden during Dr. Gray's absence.

TO CHARLES WRIGHT.

HYÈRES, EAST OF TOULON, November 29, 1868.

I had yesterday at Marseilles a letter from Mrs. Mann, conveying the sad intelligence of her son's death. Very sad it is. . . .

My heart bleeds for poor Mrs. Mann, who was wrapped up in Horace, and who feels it as the greatest of disappointments. To me, also, it is a very great disappointment of long-cherished hopes.

I expect to find letters at Alexandria when we reach there. We sail from Marseilles a week hence, going meanwhile to see some of this famous shore further east. . . .

CAIRO, December 16, 1868.

Thank you heartily for your letter of November 13. I am here learning some subtropical botany, seeing

trees growing which you have in Cuba, etc., Parkinsonia, Schinus molle, Carob, etc. Off up the Nile tomorrow. . . .

In brief, I want to retain you permanently as my fidus Achates. You are to have supreme control of the Garden. When I get home we will see what can be done. You will have to cut off Cuba till then, but can work at Flora Cubensis a good deal of the time. As far as my means can go, you shall be made as comfortable as possible. . . .

Arrangements were made to have H. sweep and keep clean the herbarium, and Mrs. L. to scrub when needed. I fear the herbarium may have been left to get dusty and untidy. Please take it in hand; ask L. as to getting H., or some one, to sweep regularly; let no dusty work that can be helped be done in the large herbarium room. Keep coal-ashes dust from the fire from getting in, etc. Spare no expense and pains to keep down dust and dirt. . . .

As to dampness in herbarium, look out according to your judgment. Air occasionally by leaving open doors of cabinets when a good fire is on, or a dry day out. The north corner of the herbarium is the only place that dampness gathers in, except the shelves next the floors. Well, do the best you can. Good-by. . . .

TO JOHN TORREY.

ON BOARD THE STEAMER POONAH,
MARSEILLES HARBOR, December 5, 1868.

We started from Paris a few days before the rest, and before Charles Loring had arrived. We changed the cold north for the bland south in one night, going from Paris to Avignon, where I had the pleasure of showing J. olive groves, old walled towns, and all sorts

of mediæval things; then at Nîmes I introduced her to the old Roman world in the well-preserved amphitheatre and the beautiful temple called Maison Carrée, ruins of temples, baths, pavements, and all that, — a charming place, of which I had very pleasant memories almost thirty years old. Then, to revive old memories, we went on to Montpellier; had a nice day with Martins[1] and Planchon[2] (whose photographs, as well as Brongniart's, I have for you); then we came on via Arles to Marseilles, within an hour of the rest of the party coming direct from Paris. They all sailed next day; we waited a week, so as to get a view of this interesting shore, which we should not be likely ever to visit again. So we went first to Hyères, where we first saw orange groves laden with fruit and tall date-palms, and eucalyptus-trees forty feet high, and all such nice things; roses by the ten thousand in hedges. . . . Toward evening on the third day, we took a carriage, drove through Mentone along the coast road to Monaco; passing by the modern and gaming district, we went into the old fortified town to lodge; went round the ramparts in the morning, saw more agaves than ever before, and the steep rock 300 feet high covered with opuntias, having stems as thick as my leg, not to say my body. Next morning took railroad through Nice to Antibes; visited M. Thuret,[3] the botanist, by appointment; a most charming man, a French Protest-

[1] Charles Frederic Martins, M. D., 1806–1889; professor of botany and director of the Botanic Garden at Montpellier.

[2] Jules Emile Planchon, 1823–1888; professor at Montpellier; author of important works on Systematic Botany and Morphology. Studied Phylloxera.

[3] Gustave Thuret, 1810–1875. "One of the best investigators of Algæ; established a remarkable botanical garden at Antibes" [A. G.].

ant; his carriage waited for us at the station; a delightful place, which made us crazy with delight, 3,000 or more species of the most interesting plants growing in the open air, where frost is seldom seen; plants and trees which starve in conservatories here grow to vast size; all kinds of things I never saw growing anyhow before! Roses by the thousand. Oh, what a delightful time! But after a nice déjeuner at two o'clock, we were off soon after three to the station, and so reached Marseilles at nine P. M. yesterday.

I have left no room to speak of the most sad loss of Mann, very sad. How it will affect me I cannot tell now, but suppose it will bring us home next fall. . . .

TO R. W. CHURCH.

ON THE NILE, BETWEEN
GIRGEH AND DENDERA, January 3, 1869.

It is only by an effort of memory that I can recall that seemingly far distant week, with which my narrative must commence, when we went, on Monday, to Nice by railway, and on Tuesday (taking my college colleague, Professor Lovering), by a carriage over the finest part of the Corniche road to Mentone, and, dropping our companion there, three miles further to Palazzo Orengo, just within the present Italian frontier; a house several hundred years old, which Mr. Hanbury, our host, has recently restored and is beautifying. It is near the base of a steep acclivity, projecting a little into the sea and commanding a view of Mentone and Monaco with the mountains behind and westward far beyond them on the one side, Ventimiglia and Bordighera on the other, and seaward on rare occasions giving a view of the mountains of Corsica, over a hun-

dred miles distant. One of those rare occasions, well-timed for us, we enjoyed the next morning before sunrise, and again in the afternoon. All that day (Wednesday) we enjoyed the place and its surroundings, and the pleasant society of Mr. and Mrs. Hanbury. They are much liked by the people of the hamlet and district, for whom they are doing a great deal, establishing a school for girls, with the hearty coöperation of the curé. Wednesday, after dinner, this good-will of the neighborhood was shown in a truly Italian way. The advocate of Ventimiglia, having some business relative to land to transact with Mr. Hanbury, stayed to dinner, and then asked permission to read and present a poem which he had composed in compliment to Mrs. (Catherine) Hanbury; it being St. Catherine's Day. It was delivered with Italian grace and fervor, and an Italian lady, now one of the family, told us that the versification was very choice. Thursday, the grounds and house were thrown open, and a collation provided for all the English people at Mentone that Mr. Moggridge chose to conduct. Earlier I walked over to Mentone to make some calls, especially upon young Moggridge,[1] whom you know, and who, I am sorry to say, had been seriously ill, and was still confined to his bed. I found him busy over the flowers and plants which his most attentive and energetic father brings to him from all the mountains around, cheerful and happy, but I fear he will hardly be able to complete his illustrations of the botany of Mentone. Late in the afternoon, after enjoying the picnic, a carriage took us to Mentone, and thence to Monaco,

[1] John Traherne Moggridge, 1842–1874; a keen naturalist. Wrote on the botany of Mentone, and on harvesting ants and trap-door spiders.

where we slept, in order that the next day might not be too fatiguing to Mrs. G. Friday, the railway, newly completed along the shore to Monaco, took us through Villa Franca to Nice, and to Antibes, where I had arranged to have some hours with M. Thuret (a charming man and excellent botanist) and his incomparable garden. . . . The only thing lacking was the magnificent view of the snowy Maritime Alps (of which I saw a sketch made by young Moggridge) which the house commands in good weather, but which was hidden from us by clouds and mist. We reached Marseilles and our hotel in the evening; had Saturday for our preparations, and at evening went on board the Poonah, which was to start for Alexandria early Sunday morning. I need not say anything about the scenery of the region we traversed, nor of the pleasure of first seeing date-palms and eucalypti, etc., and orange and lemon trees in groves, laden with blossom and fruit, and long hedges of roses in full bloom in December.

. . . Fine weather and smooth water from Sunday to Thursday evening, especially during the long and lovely day which opened with Stromboli and the other Lipari Islands directly before us, and the snowy summit of Etna in the distance, and closed with the sun setting behind the southern base of Etna, and an inverted pyramid of smoke resting on its summit. The day was perfect, and, not to speak of anything else, Etna was in full view all day long, except when hidden for an hour by the cliffs behind Messina. The latter end of the voyage was uncomfortable enough, the sea very heavy, and glad we were to land at Alexandria, Saturday noon, December 12, a showery day, the streets deep with mud and filth. Early Sunday

morning we were off by rail for Cairo, where we joined the main body, awaiting our arrival, and I had time for the English service in the afternoon, a bare dozen of people; but Mrs. L. said the congregation was very much larger in the morning. Monday to Friday we lived "Arabian Nights" in Cairo. If I let my pen run on my story might be only shorter than the thousand and one of the volume aforesaid.

On Friday, all being ready, we took to our boats, in which we have now been domiciled so long, seemingly, that events of October and November in England are dimly remembered, as if they belonged to another "dynasty." There are nine of us, in two boats. The first and larger one, in which our table is spread, the Ibis, accommodates all the ladies and myself, the only married man of the company. . . . The bow is occupied by the crew, and at the very prow a simple cooking-affair, from which excellent dinners of four courses, breakfasts, etc., are produced in some wonderful way by our Arab cook and his assistant. The smaller boat, the Undine, gives ample quarters to the three single men, also our dragoman, the younger Sapienza, a Maltese, whose time, however, is mostly passed on our boat.

An independent party, but arranged to keep in company, consists of Mr. and Mrs. Howland of New York, very nice people, with their servant and dragoman, in the Heron. But I must cut short these details, or I shall never come to an end. On Friday and Saturday the wind was dead ahead, and, tracking being impossible until we get out of Cairo, we were stationary, and on Saturday some of us visited the interesting museum at Boulak, made by Mariette. Sunday, wind still unfavorable, until nearly sunset, when

we got up two or three miles, where we commanded a superb view. In the morning you preached to the great satisfaction of your congregation of eleven, a very appreciating audience. We established a regular liturgical service. I was installed as curate; but Mrs. Gray read the first of your university sermons. . . . Monday and Tuesday, and I think Wednesday also, the boat was tracked, and so we made only a few miles a day, and some of us were much on shore. . . .

This [the temple of Abydos] was the first Egyptian structure of any consequence I had ever seen, and it is very impressive. Most of the roofing remains, and having been exhumed, for the greater part, within a very few years, the colored sculptures covering the walls are very perfect and fresh. They are in the best style, of the same age as those in the great temple at Thebes, which we have yet to see.

Yesterday we sailed along slowly, to-day still more so, luxuriating in this January weather, which is like our June at home, without any of its fitfulness. To-day we had full service, and I read your second university sermon, which all liked very much indeed, and have bespoken the third for next Sunday. Your audience consists of eight Unitarians and three Orthodox Presbyterians. By the way I was much gratified with the appreciative review of your sermons in the "Spectator," in a number which I received at Alexandria. Thanks for the other papers you forwarded also. I think only letters are awaiting us at Thebes (Luxor), but Mr. Hale may send up papers by private opportunity. The mails taken by runners carry only letters. Our latest intelligence from the Western World is barely up to the formation of Glad-

stone's ministry. I shall have a deal to read up. But here our days pass on with scarce a thought of the modern and western world, except on Christmas and New Year's days. I wish I could give you some idea of our life here, and of all we see and enjoy, but you must imagine it. We are well supplied with books, especially relative to Egypt, are busy from morn to night in a leisurely way, and are intensely comfortable. . . .

We had yesterday for Dendera, where the temple, as to structure, is in most complete preservation, but the architecture is of the rather debased Ptolemaic period, and the sculptures on the walls, never equal, I imagine, to those at Abydos, have been sadly defaced by the early Coptic Christians. But all was very interesting, and the ladies were all with us to enjoy it.

Evening. — We are lying eight miles below Thebes, which we expect to reach early to-morrow morning, and to receive and dispatch letters. So I must close this. We are writing at nine P. M., with almost all the cabin windows open. The day has been like one of July in England, — in one respect unusually like, for the sky has been overcast with light clouds, and the air sultry, ending as such a day might with a sudden and brief storm — of wind only, though it seemed about to rain; but it is now still, and the stars are shining out of a clear sky.

TO CHARLES WRIGHT.

NUBIA, BELOW DERR, January 21, 1869.

Let me begin a line to you from this Æthiopian region. The object is to inclose to you some fresh seeds of Ficus sycomorus, the true sycamore or fool fig, — not bad to eat. They were gathered

at the first cataract of the Nile, at ancient Syene, or between it and Philæ. I think you may like to send a part to Don José, for culture in Cuba, where it will be a good thing to have. And the rest, let Guerrineau try to raise some, that we may have one in the conservatory. I shall send, along with heavy things, some nuts of the Doum palm, Hyphæne Thebaica, which branches and is picturesque. That and the date palm are the principal trees here. Besides, there is Acacia Nilotica (the sont) and one or two other acacias, and an occasional sycamore. Below, a jujube tree was not uncommon, and plenty of the fine Acacia (or Albizzia) Lebbek, with its great flat pods and large leaflets. But none in Nubia. Up here the cultivable valley of the Nile is just the slope of the banks bared as the river subsides after the inundation, making a strip of green crops from five feet to five rods wide, — all else desert, either rock or sand as the case may be. We came twenty-four hours ago within the tropics, — a new thing for me, and I thought of Cuba and you. But it is just comfortably warm, 70° in the shade as I write, — has been 76°, — the nights down to 60° or so; just nice and comfortable if you keep out of the sun, which, though seemingly not hot, has an overpowering effect I never knew at home. Our winds are steady from north and northwest, pushing us up the river steadily. About sixty miles more, or may be seventy, is the second cataract, and our limit. Then we turn our faces north again, and descend, making our principal stops by the way. For thus far, we have stopped only little or briefly, taking only such sightseeing as came in our way or took us little out of it. Yet we have had a glance at several of the greatest

things. Abou-Simbel — the great rock temples of this region, and the main thing to go up into Nubia for — we hope to reach to-morrow or day after. We should have been there now, but were delayed at Assouan by long negotiations before we could get put up the Cataracts, and afterwards lost forty-eight hours by breaking the rudder of our larger boat. No letters till we get back to Thebes (Luxor) — some weeks hence. There I trust there is something from you. . . .

TO JOHN TORREY.

January, 1869.

. . . At Luxor, on our way up, we stopped only half a day, and took our first view of the great temple at Karnak. Left on the morning of January 8; reached Esneh, the capital of Upper Nubia, in early morning of the 10th. Sunday, passed the day and night there. The Ptolemaic temple, or rather the first court of it, very perfect and thoroughly cleared out within, the columns especially beautiful and all perfect. January 12, having sailed past Silsilis quarries, etc., by night, reached Assouan before noon. Here we reached the granite rocks and the basalt, and the next day visited the quarries whence the obelisks and all the great shafts, blocks, sarcophagi, granite colossi, etc., have been taken during several thousand years, the last almost two thousand years ago; and here are the chisel-marks and places cut to receive the wedges as sharp and fresh as if the workmen had only just left off work. Of course we viewed the obelisk left in the rough, only partly detached. We were moored right opposite Elephantiné, and during the two or three days' delay before we could arrange to

be taken up the cataracts, or secure fitting weather, the excursion up to Philæ was made by most of the party, on camels or donkeys (I greatly prefer the latter), and the very picturesque scenery enjoyed.

January 16 and 17 were grand days, going up the cataracts, our boats in charge of the Nubians. The first day, Saturday, sailed up to the rapids and were drawn up the first severe one, — a hard pull and barely room to get our larger boat through; 17th, a quiet Sunday, in still water between upper and lower rapids; under most picturesque surroundings of river, rock, and desert, here strangely mingled, and a hot cloudless sun; had service and much enjoyed Church's sermon No. 3. Climbing one of the rugged masses of rock toward sunset, had a fine distant view of lovely Philæ. Monday, 18th, the army of Nubians again took hold of our boats, and with noises indescribable and persevering efforts the boats were drawn, one by one, up the final and worst fall; we were in calm water before sunset, and at dusk were moored close to Philæ, which we got charming views of, from the opposite shore next morning at sunrise; came up and made a brief visit to the ruins after breakfast, and sailed on with a beautiful breeze, when suddenly, about twenty miles on, the rudder of the Ibis gave way (injured probably in the cataracts), and for forty-eight hours we lay by near a Nubian hamlet (climbed the mountains on Arabian side; got wonderful views of desert, rock on this side, reddish-yellow sand on the other), while Antonio, the dragoman, with rowboat went back to Philæ, and thence by land to Assouan, whence on camel brought up new rudder-post, workmen, etc., reinstated the rudder, and — January 21, afternoon — we were off again.

Nubia is very different from Egypt, picturesque rocky ranges always near the river and broken into peaks and pyramids, and all desert except the narrow selvage reclaimed by irrigation with sakias; here the vegetation (barley, peas, beans, and lupines) intensely green by the contrast with yellow sand or light brown sandstone.

January 23, before reaching Korosko (whence caravans to Dongola; visited their camps; very wild Arabs and blacks, and very disagreeable white traders, Greeks, probably, with villainous faces) saw our first crocodile, and sent two shots at once at him, but the huge fellow flounced off the sand bank into the river, probably not much hurt.

January 24, first met with chameleons; got three or four from the boys, but finally kept only one, which we still have here at Cairo — a lovely little brute whose name is Billy, and a great pet; a great diversion to watch his change of hues, and especially to see him catch flies by darting out his slender, india-rubber-like tongue to the length of several inches (nearly that of his whole body when the fly was far enough off), and with wonderful quickness and certainty. Service in the afternoon, with Church's last sermon, and sorry we were to have reached the end of them.

But I shall never have done with our journey at this rate, and shall give you not the least idea of it after this fashion; how some days we sailed on with fair winds, which is very cheerful; some we tracked, and then we were much on shore and mingled with the people; and often strong head winds kept us fast at the bank, sometimes for two or three days, which grew tedious. Well, on the 27th we came to the great attraction of the upper Nile, Abou-Simbel; but

the wind being fine and fair, sailed on at a great rate, and reached our terminus, Wady Halfeh, next morning. Made next day excursion to the farthest point, the high rock Abou Seir, which dominates the second cataracts, and gives extensive view beyond, far into Africa; head winds next day kept us at the village, which we explored and exchanged hospitalities with the inhabitants, the poorer part of which were beginning to suffer from famine. Later, going down, we met boat loads of corn for seed and food going up from the viceroy for their relief; little enough to do for a people so cruelly oppressed and peeled as the fellahs are. At evening we could be off, the great yard and sail now down, and small mizzen in its place, to use on the rare occasion of a south wind, and now we depend upon the current and oars, five on each side, handled by our stalwart crew, their strokes timed by queer Arabic chants; more severe labor than in ascending (except when tracking) and not so pleasant to us as sailing; but yet we could come down much faster than we came up. Whenever there was sight-seeing by day the crews would usually row all night, so we got on finely.

MESSINA, March 24.

Behold us so far back towards Europe. Here, kept in by that strange thing in our experience, a rainy day, and prevented thereby from going to Taormina (Tauromenium) to see the Greek theatre, the site of Naxos, and a near view of Etna, I resume my writing; which was interrupted a week ago by multifarious things at Cairo. . . . I think I must go back to the diary, and so try to tell you, in this mechanical sort of way, somewhat of our occupation day by day. The bare names of the places must convey to you all I can hope to of our seeings and doings.

February 1. — Reached Abou Simbel at daybreak, and were under the great giant Rameses when the first rays of the sun touched their huge, placid faces, and were in the rock temple within when the horizontal rays entering the small opening for a half hour lighted up the great Osiride figures to best advantage, and even reached the broken statues at the bottom of the adytum. Later in the day explored leisurely and repeatedly the whole interior chambers with candles, and occasionally with Bengal lights and magnesium wire (the best of all lights), bringing out well the famous sculptures that cover all the walls. Climbed the heights later in the day to get superb views of desert and river and the sunset. Late in evening some went again through the sand to see the great faces by moonlight, which, however, they supplemented by torches. We were moored right under the face of the smaller rock temple. . . .

February 9. — Awoke at Philæ; of which I will only say that even Miss Martineau does not exaggerate the interest of the whole, and the beauty and picturesqueness of the site.

February 10. — All day at Philæ, and dropped down to Mahatta just as the sun set gloriously behind the ruins and the mighty rocks which surround them.

February 11. — The Ibis shot the great cataract, all but one of our party being on the shore to see the exciting sight, — finer, it is thought, than being on board, though you thus lose the sense of personal danger. We were taken on shore round the trying points, and in our rowboats the rest of the way down to Assouan, where we joined the Ibis, vociferously welcomed by our combined Egyptian and Nubian crews, all re-

joicing, as they well might, in the safety of the Ibis, which had never done the feat before and was reckoned rather large for the undertaking. Shopping, etc., filled the day. At evening some of us called on Lady Duff-Gordon, living on her boat, now lying here. I went back later and passed an hour more with her, taking her some books we could spare her. Much pleased with her spirit and affability, but distressed at the progress disease is making; do not think she can last much longer, even in Egypt. Her last year's visit to Syria injured her seriously.

February 12. — The Undine came down famously at sunrise, and joined us soon opposite the upper end of Elephantiné, where we went up to meet her, expecting to round the island and be off at once down the river. But a heavy blow from the north, and consequent great discouragement; we had to lay by all day, not even getting on shore with any comfort, and almost all night.

You must know that in Upper Egypt and Nubia a hakim or doctor is a great godsend to the people, and you have to give medicine all day long. On returning to Assouan I was met, when I stepped on shore, by the beaming dark countenance of a papa, to whose son, whom I thought rather far gone, I had given some medicine when going up; he had now brought down the fellow from a village several miles off, to show me how well — or nearly well — he was. Another widely grinning face met me, of a papa who had brought me his boy with a dreadfully ill-looking sore head, which I had dosed with mercurial ointment rubbed in with colza oil. He did not now bring the lad, but came a good distance to recall him to my recollection by expressive pantomime, and to say in

the same way that he was "all right." Eye-wash I dispensed in profuse abundance; and among the men cured several cases of ophthalmia which looked serious; and many a petty surgical operation did the "Hakim-Pacha" — as he came to be called — perform. I cannot tell you how much attached we got to our crews and their officers, and before we parted I made sure that many tears should flow in my behalf, by acceding to requests for eye-lotions, which were most copiously used, — by those who needed it, for cure, by those who did not, for prevention. Two sorts of creatures with which I formerly had little sympathy, I have learned to appreciate and respect,— donkeys and people of color, Arabs and Nubians especially. All idea of anything disagreeable or inferior in color of skin disappeared, or rather the darker fellows seemed the finer. As I remember sundry dark Arabs, they seem to me among the best-looking and best-behaved men I ever knew. But this digression will never do. . . . At sunset reached Edfou.

February 15. — Whole day at the temple, which is all but entire, and large as well as complete, and the acres of sculpture and hieroglyph in excellent preservation, all recently excavated under the care of Mariette and placed under a custodian. If I could be dropped down in Egypt for one morning only, to see only one thing, it should be this temple at Edfou, though only of Ptolemaic date. I cannot stop for a single detail about it. . . .

February 22. — Luxor: across river, tombs, Medinet el Bahree, Ramaseum, again, etc. I and some others dined in the evening on boat with our English friends (Legge, Eaton, and Baird), and celebrated Washington's Birthday.

February 23. — Boats dropped down to Karnak, had afternoon at the great temple, tea there at dusk, — a famous tea-party in the great hall of columns, all the dignitaries at Luxor and Karnak invited; the full moonlight enjoyed for an hour or two, and then illumination with Bengal lights, making splendid effects among the 137 columns, and other parts; then rockets; some of our parties back to boat, the rest to a feast given by a splendid old Arab, the chief of Karnak, in full Arab style, with music, dancing-women, and all. Imaun Joseph, who had been our guest at the temple tea, was his relative's guest at this banquet. Lady Duff-Gordon's account of him had made him known to us most favorably, and we got most thoroughly attached to the man, especially after having him to dine with us next day, his smile, voice, and manners of the sweetest, and his character is every way lovely. He is as dark-skinned as most American negroes, but with very handsome features. All these experiences cannot be written, but could be talked over at large. That evening view of Karnak is the one I want to keep, so I did not go again; Mrs. G. did once more.

February 24. — Tombs of the kings; a grand but fatiguing day, most of the time in Belzoni's, the finest and largest; most of us did two or three more. I came home over the mountains to get the fine view over the valley, etc. . . .

March 4. — Siout: ascended the hill for the great view, from mouth of one of the great old tombs; shopped in the pretty town; accepted the American consul's great attentions for the morning only (rich Coptic Christian family), but tore ourselves away from entreaties to stay for dinner and fantasia in the

evening, in honor of the inauguration of the American President, so secured the good wind and were off in the afternoon. . . .

March 9. — Went over the site of Memphis; saw the colossal figure of Rameses lying pathetically on his face, pyramids of Sakkara, Serapeum, the wonderful Apis sarcophagi, and finally that newly excavated, beautiful tomb structure, of date very early in old empire (fourth or fifth dynasty), with paintings and low reliefs with truthfulness, spirit, taste, and fineness of execution, much surpassing the best days of the later empire, and all free of the grotesque mythology of later times. A fine treat to come at the last.

March 10. — Hard rowing against wind to reach Gizeh; went in carriages, by road made for the Prince of Wales, to the Great Pyramid and its fellow. I went in, but no one ascended, — too much wind; Sphinx, neighboring old tombs, etc., etc.

March 11. — Cairo: packed and left the boats so long our home, and good-by to the sailors.

March 12–18. — Cairo: must not forget one day passed at Mariette's museum, studying specially the fine things of old empire which he has discovered and rescued. Had fairly enough of mosques, Moslem tombs, modern palaces, etc. Sorry that slight illness cut off several things, notably a drive to the site of Heliopolis, marked only by a single obelisk. Steamer from Alexandria would not wait, so we must needs hurry off, our pleasant party break up, etc.

March 19. — A morning drive at Alexandria, to see Pompey's Pillar, the Obelisk, etc., and so on board the Peluze; a beautiful evening, but blowy weather followed, — a seasick time; and here we got, not Monday evening, but Tuesday morning, boat gone to Naples

the day before. . . . Mrs. G. badly knocked up, and here is cold spring weather and fickle, weeping skies, so unlike the thoroughly reliable weather which we had got to regard as a law of nature; wherefore such freaks take us all by surprise. Oh, how we long already for the dry air and certain sky of old Egypt! . . .

TAORMINA, March 25, evening.

We have done it, after all, or at least are in the way of doing it. . . . This morning, when the sea looked rough with the recent gales, although the very low barometer began to rise, I was not sorry when the Florio steamer was kept back, waiting an overdue corresponding vessel from Malta, and, though announced to sail to-morrow, I determined to wait yet longer for smoother weather. Meanwhile it cleared off beautifully, though with considerable wind. At four P. M. this afternoon we were off by rail with small luggage needful, on the Catania railroad; an hour and a half along a coast more picturesque than the finest parts of the Corniche road, though not so grand, brought us to Giardini; whence an ascent of an hour up a zigzag road in a one-horse carriage, commanding charming sunset views all the way, old Etna full in view southwest, brought us to this queer perch. It reminds us of Turbia, but is far more striking. We are in a primitive, but very nice auberge; our window looking full upon the whole mass of Etna glistening in the clear moonlight. On the left hand we look directly down upon the sea and along the jagged coast; on the right Taormina Castle overhangs us almost, the old castle or forts covering its narrow summit, probably 1,000 feet above us; it must command an extraordinary view. We shall see to-morrow. Rather behind

us lies the amphitheatre, on a craggy buttress between us and the sea.

Morning; up at daylight, to the amphitheatre, to see sun rise out of the sea and light up Etna, which was without a cloud. The theatre really a Roman ruin, with bits only of the original Greek; the situation superb. . . . I climb up to Mola, get a grand study of Etna from height of 1,500–2,000 feet, the clouds keeping off till I had done. Extensive sea and coast view, but haze in the far distance. Descended on to the peak bearing the Saracenic ruins of the Castle of Taormina, overhanging the town; and now, having dined, and found Mrs. G. better, as well as desirous of warmer quarters, we are soon to descend to the shore below us, and take train for Catania. This place is very well worth visiting, and I am glad that I arranged as I did, only sorry that I had to enjoy most of it alone.

NAPLES, Tuesday, 30th.

Found Catania well worth a visit; had pleasant Easter Sunday, and superb view of Etna, and of its various former doings, sending its lavas down to the sea in a tremendous way. Getting back to Messina, the steamer, a little one, was off Monday afternoon; good parting views of Etna toward evening; an uncomfortable night; we entered the bay at daybreak, and Naples soon after sunrise, and are now domiciled in full view of Vesuvius.

TO A. DE CANDOLLE.

ROME, April 22, 1869.

. . . I am thirsty for botanical news, after having laid aside the botanist for a much longer time than ever before. Well, we were three and a half months

in Egypt, three months of it on the Nile itself, and we have avoided the chills of winter and had a season of great enjoyment and interest. I passed your friend Professor Marcet in Nubia, but missed visiting his boat, from his sailing under the English flag, but hit upon that of Mr. Naville,[1] whom we saw afterwards at Edfou, and were much pleased with.

Botany on the Nile is nearly *nil*, yet I collected a small suite of specimens, as souvenirs. Returning, we had a most uncomfortable passage to Messina. . . . In Naples and in the charming environs we passed a fortnight and rather more, and have now had a week in Rome.

We are just now recovering the mild and charming weather which we left behind in Egypt. We shall stay here, I suppose, only ten days more, make a short stay in Florence, also in Venice, visit the Italian lakes, and, I think, go to Vienna by way of Innsbruck, to be there the first week in June. All else is uncertain, except that we mean to be in Switzerland in July. . . .

Dr. Gray said he found more botany in a half day in the desert than in a week in Egypt! A country cultivated for five thousand years had no weeds. There were long walks and occasional excursions in Nubia into the desert when the dahabeah was lying still.

TO CHARLES WRIGHT.

MUNICH, June 8, 1869.

. . . It is hurrying and distracting work, this traveling with a pair of nice young ladies, sharp for

[1] Edouard Naville, of Geneva; distinguished Egyptologist; since 1883 the representative of the Egyptian Exploration fund.

sight-seeing, . . . and a lot of botanists and gardens, etc., you want to see on your own hook. So you will excuse all curtness in letters. . . .

At Munich we saw, of course, much of Madame de Martius,[1] — a sweet, good soul, deeply grieved by the loss of her husband, and yet bears up bravely. And we learned many interesting things about good Martius. Notices of Martius' death were sent, as usual, to all friends. . . .

11th. Nuremberg is a queer old place indeed. We have nearly twenty-four hours here, and go on the way to Dresden to-day.

TO GEORGE ENGELMANN.

DRESDEN, June 13, 1869.

I 'll tell you what our plans are at present. To stay here till Friday noon, the 18th; Mrs. G. to be very quiet, as she cares mainly to see the gallery and enjoy it leisurely. On Tuesday, I, with the young ladies, go up to Freiberg to visit the celebrated mining school, etc., and on return next day, to see the Forst-Akademie at Tharand. Friday night all to Töplitz, to pass two days with a friend, — the Sunday's rest. Monday to Prague, Tuesday to Regensburg, Wednesday or Thursday to Munich, and Saturday evening to be at Ragatz (or Pfeffers). Soon after at least Mrs. G. and I will be settled for a while at Geneva.

HÔTEL BYRON, VILLENEUVE, July 15, 1869.

. . . Boissier has been seriously sick with a pleurisy, etc.; is at Orbe, or was. If still there I should go to see him; but he has now gone to Gries, in Appenzell, to a bathing-place, and I shall not see him. . . .

[1] Von Martius died in March, 1869.

Reuter, his curator, was away last week, but I shall see him, I presume, to-morrow.

I have just lost my mother, at a good old age. My father died twenty-four years earlier. . . .

It is a charming place here. We are spending the morning lazily, and go on soon to Geneva. The young people have gone on to Chamouni, which we do not care to revisit. . . . Kindest regards to Professor Fenzl, with regrets that I shall not see him.

TO JOSEPH HOWLAND.

INTERLAKEN, July 26, 1869.

. . . We have had a joyful time in Switzerland, and for me a complete rejuvenation. And as to Mrs. Gray, who did not need that, what we call "the movement cure" has done her more good than all Egypt. That my lamentable failure of breath on Piz Langarde was owing, not to advancing years, as I had foreboded, nor wholly to the rarefaction of the atmosphere above 9,000 feet, as Mrs. H. suggested, but to a violent cold, then impending, I proved satisfactorily by walking the other day down from Mürren to Lauterbrunnen (having walked up the eve before), and then right on over the Wengern Alp to Grindelwald, and I believe as comfortably as I did it (all but the first part) thirty, and then nineteen, years ago!

Weather has been all we could ask for, — this the first rainy day to keep us indoors, and it now promises to be pleasant by noon, so that we can go to Giessbach. Let me tell you what we have done. . . .

Wife and I started Thursday, to Sierre, by rail. Friday, carriage to Visp, and horses to St. Nicolaus. Saturday, char-à-banc to Zermatt, and horses to hotel on the Riffel. Only my wife's own pen can relate

how she felt in flesh, bones, and spirit after that, nor her surprise to find next morning that she was "alive, and alive like to be," nor her keen delight in Matterhorn, Monte Rosa, and surroundings, and the profusion of alpine flowers. Sunday and Monday on Riffel most enjoyable. Tuesday, Mrs. G., thinking *facile descensus* inapplicable to such a steep path, insisted upon walking down to Zermatt, which she did; a long rest at Zermatt, with pleasant English friends, and a dinner enabled us to go in char to St. Nicolaus to sleep, taking a small thunder-shower in the way.

Wednesday, "we still live," and go on horses, through two showers, to Visp again, and then carriage to Sierre and rail down to Hôtel Byron, to get charming view and sleep.

Thursday, all fresh comparatively, and go in a chaise to Chillon, and then back to our pleasant quarters in Hôtel de la Metropole, Geneva. Here we rest, see friends, and do botany till Tuesday last.

TO R. W. CHURCH.

LONDON, August 22, 1869.

. . . With all my endeavors I could not get off a note to you by yesterday's (Saturday's) post, and so shall be late in announcing to you our prosperous return to England. We left Paris on Thursday, reached Amiens in time to visit the cathedral, a most striking specimen of fullest-flowered Gothic, saw it again on Friday morning, and, after a smooth crossing, got to London before sunset. Yesterday I had to go to the banker's, to Kew, and to see our Harvard men at Putney.[1] I must now needs be with them on their trial day; and then, tell me frankly if it would per-

[1] Boat-race between Harvard and Oxford.

fectly suit Mrs. Church and yourself if we came to you on Saturday (28th) for a few days. Later would serve us, if you prefer. . . .

After that I hope we can get settled at Kew, and do some work, for which I have little enough time left.

As to Exeter meeting of British Association, I am on the whole glad enough to keep away, especially from Darwinian discussions, in which I desire not to be at all "mixed up" with the prevailing and peculiarly English materialistic, positivic line of thought, with which I have no sympathy, while in natural history I am a sort of Darwinian.

TO A. DE CANDOLLE.

KEW, [CHARLTON HOUSE], September 20, 1869.

The skies were propitious to us in Switzerland, and the only very warm day was the one which we passed, very pleasantly indeed, with Godet at Neufchâtel. Thence we went to Paris, stopping at Dijon en route. . . .

Oliver and Baker are here steadily at work. Dr. Masters[1] drops in now and then. Dr. Hooker, after some respite, was at home. Dr. Thomson returned last week; and now Bentham is here also, fresh from the Continent.

At British Museum I find Dr. Carruthers[2] and the new assistant, Dr. Trimen. Mr. Bennett still, I think, away on his holiday. Botanical and other news I have none. I send you this mere apology for a letter, in the hope of getting something from you;

[1] Maxwell T. Masters; editor of *Gardener's Chronicle*; author of *Vegetable Teratology*.

[2] William Carruthers; botanist of the British Museum, London.

and later I may have more to say. Can I be of any use to you here?

Remember me kindly to Dr. Müller,[1] to whom best thanks for all the friendly services which he has rendered me.

Our united kind regards to Madame De Candolle, and to your son (from whom I still expect a photograph), and my wife's to yourself. We have the most pleasant recollections of our brief visit to Geneva.

Believe me ever your devoted ASA GRAY.

TO GENERAL HOWLAND.

KEW, October 3, 1869.

I don't know when you would get a response to your welcome letter of August 22, which reached us here in due course, so long as things went on in the ordinary way, — I working at botany as much as possible, but presiding here over a considerable household, some sight-seeing and much intermittent visiting. But now that I am all alone, and my wife with the rest of them *girareing* over the north of England, sober reflection has its hour, and I remember the friends that are far away, perhaps on the shores of Italian lakes, and long to know how they get on and what they are about. To attain which knowledge and put myself *en rapport* I should first, I know, give you some account of ourselves and our doings.

But where to begin? I think we wrote you from Paris. We had three weeks there, I mostly at the Jardin des Plantes till near dinner-time. . . .

For ourselves, after cool weather in Paris we came

[1] Johannes Müller (Argoviensis); late director of the Botanic Garden at Geneva. Has written largely on Lichens.

in for a piece of very sultry weather in London, where we had to stay awhile, our lodgings here not being available till about 15th September. So after staying to the Harvard boat-race, — which I saw from the umpire's boat, and Mrs. Gray, with good Miss S., from some grounds above Fulham, — we set off on a little round of visits, first to the Darwins', near Bromley, then to the Churches' in Somersetshire, a pleasant country rectory and a delightful couple. You remember the university sermons we had up the Nile were his. Next we passed a day with an old bachelor botanical acquaintance near Taunton, who makes a capital squire; then to Torquay for three days (with a daughter of Sir William Hooker, and her husband, Dr. Lombe), one of which I devoted to an excursion down the river Dart from Totness to Dartmouth (which the English think much of, but you dwellers on the Hudson would not), and to a view of that quaint little town. On our way back we had an hour at Exeter to see the cathedral; a night and morning at Salisbury, the cathedral as to exterior, site, and all, and beautiful spire, one of the most satisfactory in England; took a glance at Wilton, a peep into old George Herbert's little church of Bemerton and into his house and garden; stopped over a train at Romsey to see the fine Norman abbey church, and to Winchester, most interesting cathedral as to the interior, Winchester school and the old Hospital of St. Cross. Then, on returning to London, we settled down here, and after a few days were joined by the rest of our party from France.

. . . No one in England recognized me with my venerable white beard!

Ever, dear Howland, your affectionate

ASA GRAY.

The winter Dr. Gray spent in Egypt, in 1869, he raised a full beard, which so changed his appearance that, though eyes and voice were there, his oldest friends did not know him on his return, and he had great glee in imposing himself on his old friend Dr. Torrey, when he went to the station to meet him in Boston, as a persistent hack-driver. Even when he declared himself, Dr. Torrey would scarcely believe him; he and Professor Henry always maintained a man had no lawful right so to change his outward appearance after middle age.

TO R. W. CHURCH.

KEW, October 6, 1869.

. . . A week ago Saturday Mrs. G. and I went down via Warwick to Stratford-on-Avon, where we had never been, with Professor Flower,[1] to visit his father and mother, whose house (almost always thronged by Americans), a short mile out of Stratford, commands one of the most charming and wholly English views (that of English landscape-painters). On Monday morning Loring and the girls, who had passed the Sunday at Warwick, drove down and took us up, and we saw the Shakespeare memorials, even to Anne Hathaway's cottage (all but myself, who studied brewing instead), and back to "The Hill" for a lunch-dinner. Then they took my wife and departed to pass night and next day at Warwick. At evening I went by a direct train to Oxford to sleep, seeing first Professor Rolleston[2] for a moment. And, breakfasting

[1] Sir William Henry Flower, M. D., London; curator of the Hunterian Museum. Succeeded Owen as director of the British Museum of Natural History.

[2] George Rolleston, M. D., 1829–1881; professor of anatomy and physiology at Oxford.

with him and his agreeable wife next morning early (his windows command a lovely view), set about seeing all the structures, etc., that have sprung up since the almost twenty years that have passed: the Museum and its workings, the Ratcliffe turned into an admirable reading-room, chapel of Exeter, also Balliol, new buildings of Christ Church, etc. I did not fail to look in upon the quadrangle of Oriel, also, to ask for Mr. Burgon, but he was in France. After lunch I took train, and was in Kew soon after sunset. Since then I have been away one day and one night, with Mr. Rivers of Orchard-house fame, at Sawbridgeworth, Herts. . . .

TO JOHN TORREY.

KEW, October 11, 1869.

I am now almost through with my examination of the Polemoniaceæ, for which I brought over all mine here. I have got them into good shape, settled many things only to be determined here, and have a clear and definite idea as to what I would do with the genera, and have straightened out the species.

October 31.

After so long a drought — as happens in some climates — when the change comes, you pour refreshingly. But with all your three rapidly following letters not one of them makes the least reference to my letter, written for one special purpose.

Bennett is as pleasant as ever. When I go up next to British Museum I will give your regards.

Old Gray (J. E.), who has ever been particularly kind to us, has had a paralytic stroke, which, with

other infirmities, seemed about to close his life. But he is wonderfully rallying. . . .

How glad we are about the grandchild, and what real comfort and delight you will have with the little fellow! And then the satisfaction of having your name go down in the direct line. Why, he may be a botanist, or at least a chemist, and add honor to the name in another generation. Please give, with our love, our united congratulations to the happy papa and mamma.

We have been corresponding with Carey, and shall see him soon.

The sheet is full; so adieu for a few weeks. Ever your affectionate A. GRAY.

TO R. W. CHURCH.

QUEEN'S HOTEL, LIVERPOOL, November 8, 1869.

We broke up our establishment at Kew, this afternoon, and are having the night here, preparatory to embarkation. Before leaving Kew I received the proof of your sermon,[1] and here I found your last note, and Loring another proof-copy of the sermon; for which he sends best thanks.

So you have been again to Windsor, and this time, I trust, had her Majesty in the congregation. . . .

Loring, the young ladies, and myself had the Sunday at Canterbury, our last cathedral, and a most interesting one, both in the sight and the associations. We have Stanley's "Memorials" to read up, with other things, on the voyage, if the Atlantic will allow it.

Wednesday morning. — Off Irish coast; shall reach

[1] Sermon preached in Westminster Abbey, at the consecration of the new bishop of Salisbury.

Queenstown before noon; very smooth water, especially since we were out of the St. George's Channel. We are all doing very well, though some of our party, including Mrs. Gray, are poor creatures on the water.

I have read over the sermon with real interest. What I much like in it is the broadness of view and moderation of claim, which adds strength to the argument. It seems to me that every Christian man, churchman or no, would yield full assent to all you say.

And, dear Mr. Church, consider that all your friends think, no doubt, as I do, that you are hardly at liberty to take counsel of your misgivings and humility, if asked to take some position in which your gifts may tell more directly upon educated men, especially the younger men. I don't want to see you in a position which brings cares and anxieties along with high honors; these I do not covet for you in the least. What I covet for you is fruitful leisure, some position for you which, while it gives you time, and income enough to supply real wants, makes also some demands; for rarely does one do anything to much purpose that he is not somehow constrained to do.

We leave behind us in England most delightful friends, and we are not likely to forget them; but we are somehow drawn to you in a peculiar way, and shall often be thinking of you and yours when settled down again, if it please God that we may be, at our pleasant home on the other side of the Atlantic.

CAMBRIDGE, MASS., November 23, 1869.

Just a line to tell you — which you will be glad to know — that we safely accomplished our voyage home,

landing yesterday morning [Monday] early, on the thirteenth day. Very well for that vessel, the slowest of the line, and at this season, with much head wind. No gales, but some stiff breezes, and the vessel tumbled and rolled about, to our discomfort. However, it is all over; and Mrs. G. and the other ladies, who suffered a good deal, are looking brighter again.

My wife sends kind love to you and all yours, and the young people, if they knew of my writing, would send kind and grateful messages. The voyage now seems to me only as a disturbed night's sleep, dozing off in Old England to awake in the New.

Ever yours affectionately, A. GRAY.

TO CHARLES DARWIN.

CAMBRIDGE, February 14, 1870.

MY DEAR DARWIN, — Being eve of post-day we respond at once to yours of the 27th January — which arrived this very morning — lest you should send us down to posterity with a fabulous dog-story.

I well remember telling you of our "Max"[1] and his habit of washing cat-fashion; which you suggested might have come from being brought up with a cat, and I think I told you that I had not been able to learn definitely whether that was the case or no. Here, you see, by some shuffling of memory, a suggestion of what might explain a fact has taken the place of the fact itself. I am curious to know if it be true, for it is the only explanation I can think of.

I trust you have some of the slender-leaved Drosera I sent through Hooker.

Well, our homeward voyage was not a nice one,

[1] Dr. Gray's black and tan terrier, his loving companion for twelve years.

especially for Mrs. Gray, and it now seems a long time ago. I dropped at once into a world of work; but am not killing myself. The main struggle for existence will come in the spring, when my duties crowd on me dreadfully.

It gave us both very great pleasure to see again Mrs. Darwin's well-known handwriting, and your signature.

I knew you would be pleased with young Agassiz and his Yankee wife. I wish his health were better; and I do hope your own will be such that you can next summer see and know my trump of a colleague J. Wyman.

TO GEORGE BENTHAM.

CAMBRIDGE, March 28, 1870.

. . . You hope that I will not resign my chair here unless to devote myself wholly to botanical work. What other object could I have in view? I am not likely to be idle, and I care for nothing else. The difficulty is, that the university cannot well spare me now, nor find a fit person to take either the whole or a part of my work, but there is a good disposition to favor my views.

Charles Wright is helping me as curator of the herbarium, and is getting the large accessions into it — rather slowly.

The winter is nearly passed; I have employed diligently all the time I could command, but the net result looks small. All I have for the printer is a revision of Eriogoneæ, which I have turned over to him, and which you shall soon see. I think I have done it very well. I have in Eriogonum made use of a character which you have not employed, i. e., the

attenuation of the base of the flower into stipes, which marks the umbellata and the eriantha well, and I have increased the number of the sections. The species I have actually diminished from eighty-one to seventy-nine, although several had been added to those in the Prodromuses, and I have added half a dozen myself.

I should have written to you long ago, but as you would always have news of me through Hooker, and I had nothing special to say, I refrained. It is always a pleasure to hear from you, and I have no idea that our long correspondence should drop. I should have seen more of you and Mrs. Bentham (and my wife, too, regretted much), but you were much laid up with that sciatica, and we were dreadfully pressed at the last. Could we have had this winter in England, as we had at first hoped, it would have been well.

Torrey made me a visit in January; is well and happy, except that he gets only odds and ends of time for botany, and so cannot do anything to much purpose. The Eriogoneæ being a pet group of his, and his old sketches very useful in my elaboration, I have joined his name to my own in the paper I am now printing.

At the wonderful rate you are going on you will soon complete the "Flora Australiensis." Happy and fortunate man that you are, both in the faculty of accomplishing work and in having your whole time for just what you want to do.

TO R. W. CHURCH.

CAMBRIDGE, MASS., U. S., February 15, 1870.

MY DEAR CHURCH, — My good wife has just handed me these sheets for Mrs. Church, and if it were not just on post-morning I should gossip with you, I sup-

pose, to the extent of a sheetful, and send you our hearty thanks for your most kind and welcome Christmas letter, — the acknowledgments for which have been deferred too long already.

For myself, I have had three or four delightful weeks out of our short winter vacation, which have been given wholly to botanical work in my study. But this week begins again my round of official duties, to continue till July.

I rather weary of it as I grow older ; and still more I grudge the time. I could now, I see, make fair arrangement for relinquishing a large part of my work in the university if there were some one ready to come in as a colleague or suffragan. But the person wanted is not to be found, and it will take a long while to hatch and raise one. We shall see.

I keep up all my lively interest in English affairs. But I do not get the items of news now as early as I used to do when the "Gardener's Chronicle" had a news-sheet attached. I do well enough in the scientific line, however, as I see both "Nature" and the "Academy." The former should bear for its motto "Natura non facit saltum ;" it does not jump at once to perfection ; the articles are many of them rather weak and washy. The "Academy" in its way seems better. The "Athenæum" (which I hope will revive, now that Dixon is out of it), the "Saturday Review," and the "Pall Mall Budget" come to us in our book club, after a while, in our turn.

So Temple, having carried his point, is now making his over-active opponents look a bit foolish by preaching earnest orthodox sermons. And Gladstone has done a (to me not unexpected) thing which gratifies his friends here, in giving to Mr. Fraser the see

of Manchester; I had not heard of the death of the former incumbent when the news of this offer came. What a run Gladstone is having in the way of church patronage! Then the memorial from both universities themselves for the abolition of religious tests! How you are getting on! And how are you to manage to secure proper religious influence at the universities? By moral power and the strength of your cause alone? which may, after all, be more truly effective than statutes. Yet there will be natural anxieties.

Pray give me, now and then, an inside view of what is going on, or better, what is thought.

Why, here is my sheet filled and nothing said. I have nothing to tell you from here — nothing worth sending you. I don't think much of Lowell's "Cathedral." The grotesque bits are not in half as good keeping as the gargoyles and other queer pieces of ornament on the old cathedrals.

CAMBRIDGE, April 4, 1870.

I have for a long while been wishing and endeavoring to write to you, but it is not so easy, so many other letters have to be written, to answer letters from persons that I don't particularly care for, as to leave little time for those that I do.

I owe you for two very interesting letters; for it was a hurried note of mine that we need not count, which crossed yours of February 4, and then there is your later one of March 1, along with Mrs. Church's to my wife. I leave it for her to tell you about the novelists. And I have not much to say of myself. I have pottered all winter over the herbarium and upon an article for our "American Academy's Proceedings," of a wholly technical nature, which is just in

the printer's hands. I am about to begin another, — a study of another group of North American plants; but the professional work absorbs so much of my time and energy that it will, I know, make no great progress until July brings a long vacation. And then I may have my hands full, somewhat as yours will be, superintending building. I have *my* church to enlarge. I need a lecture-room here on the spot, and a students' laboratory in connection with it; and I have a plan for this, to form a wing to the herbarium building, and a fair prospect that I may get it done. We shall see before long; and if the means are forthcoming, I will soon let you know, with all the details. . . .

The last "Spectator" received gives an abstract of Gladstone's and Forster's Irish Land and Education bills, and of the general favor they were received with upon their introduction. To have almost satisfied all parties and interests is really a wonderful and a most unexpected achievement. You ought to be proud of Gladstone, and well satisfied at having inevitable and great changes wrought out under so strong a ministry, and so high-minded a leader. Courage, earnestness, and high principle here are seen to command success, in Parliament at least. How anything will work in Ireland remains to be seen. But don't think as some of my English friends do, that the Irish are incapable of good things. The race over here, as a general thing, develop at once what they seem to lack at home, thrift, and with thrift come order and respect for law.

I happened to be in Boston on St. Patrick's Day, and was stopped in my carriage while a very long Irish procession passed. They were mainly of the more well-to-do sort, no doubt; but they had made them-

selves so. Probably nearly every one of middle age was born in Ireland, and would have been a peasant laborer at home, very likely ill-conditioned enough. They were, however, in holiday attire; still they were fair representatives of the race, and I wished we could send them over to you for a day, as specimens of what may be made out of such material, under circumstances, not altogether the best, but much better than those at home. They are not the best element of our population, certainly, but they make by no means a bad lower stratum, out of which many show a truly Yankee-like aptitude for rising. They are almost all Romanists, to be sure; and there is an element of danger. But the influence of the priesthood is much tempered (as witness how they ran into Fenianism, against their exhortations) and in most respects is far from bad. The Germans are counted as a much better population, but they are quite as clannish, and in the towns are rather disposed to be actively anti-Christian.

By the way, I met some time ago Mr. Stanley, who has been in the country before; is now on his way round the world via California, a favorite route. He is, or was, an M. P., a son of Lord Stanley of Alderley, an Oxford man, bright, sharp, and very talkative. He is a specimen of ultra-secularistic liberalism, I should think, of a set that will be apt to give you some trouble hereafter, in the questions that are to come up; if I do not misjudge him, one who thinks the world, or at least England, has not much farther use for distinctive Christianity; just one of the sort you must have had in view, in yours of February 4, as extremely generous "in making free with what other people value, and you don't care for." Most

uncivilly, I fear, I fell almost into a wrangle with him directly. He even seemed to think us on the whole a bigoted set here in Cambridge, — rather a novel view to us. . . .

Well, I must break off.

Our spring is tardy, after a wintry March. Only snowdrops yet out in the Garden, and those in the sunniest place, a lot which I brought with me from England. For primroses we have to look into a cold frame, in which they, with violets, have been blossoming all the latter part of the winter.

TO A. DE CANDOLLE.

November 15, 1870.

My dear De Candolle, — Many thanks for your most kind letter of the 24th October. Taken along with one from Mr. Bentham of about the same date, it gives me tidings of several of our French confrères, who are now in such great tribulation. What a change since last year, since last summer even; and for Mrs. Gray and me, how fortunate that we had our visit made and over before the deluge! And what can be the end, and when? It is useless to conjecture. And now there is fear that while Germany is holding the Gallic wolf by the ears, — a situation growing daily more uncomfortable and dangerous for Prussia, and England is left quite alone, — Russia is to take a step forward in the Black Sea, etc., which will greatly vex England and Austria, and perhaps send the torch of war all over Europe; and if all closes up soon Europe will feel this powerful Germany. But it may be the better for Switzerland, whose danger is always from France. It used to make me uneasy and indignant to see the French flag on the shore of your Lake, where it has no business to be!

The Caruel[1] pamphlet reached me to-day. To the first question the answer is simple and easy. About the second, there is perhaps more to be said. As the publication of a name without a character goes for nothing, why should the dubious proposal of a name with a hypothetical character go for more? And suppose the suggested character does not prove true, and a genus afterwards be founded well upon the same species with a good character, and under another name, must that give place to the conditional name, etc.? Vain the endeavor to settle every such little question by the terms of any positive enactment.

One thing I see, that is, that our solitary point of disagreement will erelong disappear. The fact of the publication of a certain name, at a certain date and a certain place, being the main thing, the form (and I add the agent) of publication being a subsidiary consideration, I think you will come to agree that, *e. g.*, names proposed by Fischer and published in his name by De Candolle, must be said to be Fischer's, and cited, in the last resort, as, *e. g.*, "A. dasyglottis, Fisch. in DC.," just as I write "Phlox rigida, Benth. in DC." For all the rest, I think I agree with you fully. I perfectly agree that, *e. g.*, "Diceratium Lag." is correct only as a generic name, that "Sect. Diceratium DC." is the only correct way. I myself and others have not followed this proper course always in former times; but should do so hereafter. . . .

Believe me to remain as ever, most cordially yours,

ASA GRAY.

[1] Theodore Caruel, professor in Florence.

TO R. W. CHURCH.

CAMBRIDGE, October 14, 1870.

MY DEAR FRIEND: . . . I have the hour of leisure and am in the mood for writing this evening. The latter I may count on, but the former I cannot, in these busy and rather distracting days.

On Tuesday evening last I heard Tom Hughes give a public lecture, the only one he gives in America. He manfully stood up and turned the tables upon us, by insisting that the Americans were wronging the British, by blaming them when they ought to be praised for their general conduct during the war of the Rebellion. His lecture was very able and pleasant; and he seemed well pleased, as well he might be, at the reception of it. He, at least, did excellent service in our behalf, in our times of trial.

The next evening I met him at the house of a colleague here in Cambridge, and had a very pleasant talk with him. On telling him that I came near to hearing him speak to the electors of Frome, and was prevented only by the rainy day that made our walk to Longleat too late, he spoke of you with much interest, and told me, what I did not know, that he was of Oriel while you were tutor. He is very much pleased with his trip through the country.

As to the Franco-German war, it is thus far a succession of wonders, and now when a week passes, like the last, without any astounding event, one feels dissatisfied. At first, the crowning and unexpected result, of judgment overtaking Louis Napoleon here on the spot, was only to be rejoiced over. And I think you in England must all be glad to see the vulgar Empire vanish in a day, and in the collapse show how hollow and good for nothing it was in what we

supposed its strong side, military force and military ability. But now, it is painful to see France reduced to such straits, and I long to see peace made with as little weakening of France as may be. Only, if it goes on, this chastening, and the effort it may induce France to make, may regenerate her spirit. But, as you say, only the prophetic books of Scripture furnish language in which to express one's feelings and sentiments.

"And then this nation will I judge, saith the Lord" — sounds in your ears, as these vast changes sweep on.

If I fail to enter wholly into your feelings as to Bismarck and Prussia, here is Mrs. Gray, who has been anti-Prussian from the very first, and who shares all your misgivings, and more. Now, I think it a pity, and a loss to the world, that the German people should be broken up into jealous rival kingdoms and little principalities, always liable to be played off against each other by outlying nations. I think Germany as such ought to take its place as a great Central European power. And yet a simple centralized government is dangerous; at best could ill replace local governments. So I hope for, and expect, a close confederation of German states, in a restored and efficient German empire, the states of which will be as closely united as those of our Federal Union, but yet sovereignties in all that relates to internal concerns. I don't despair of the Germans working out a fairly successful constitutional parliamentary system, along with state parliaments, etc., after their own fashion. And I fancy that a united Germany will tend to peace in Europe, when one section can no more be played off against another.

But what sort of a policy is this which Great Britain seems to have been pursuing in weakening, and as if inclined to sever, her connections with her principal colonies? Why not contrive some mode of uniting home and colonial interests, giving the colonies imperial representation, or something of the sort, or somehow be making sure that the men you will be wanting one of these years shall be sturdily growing up on these virgin soils, where crowding is out of the question, and who may feel as they grow up that they are part and parcel of a strong empire. For myself, I can't abide the idea of the English nation ever coming to play any secondary part.

As for ourselves, I feel more and more what a good thing it is, and what an economy in the long run, to have no neighbors, but the whole breadth of country to ourselves, and to be so far away from Europe that we may look with unconcern upon the rise or fall of states there, so far as they affect any interests of ours. That does not prevent our being all alive to events in Europe, however. The telegraph feeds our lively curiosity, day by day; but what I write about to-day will have ceased to interest by the time it reaches you: perhaps the strife all over there; devoutly do I wish it may be.

I see you have taken up "Anselm" again; and that, I presume, is the book you are going to send me, and which I shall be pleased to see.

Yes, you must come over here; but when you do, please arrange for time enough. When you cross the ocean, be sure to stay long enough to get your money's worth. If it be the summer after next, perhaps we may cross the continent together, and see the parent of your Wellingtonia tree on the lawn, and the rest

of the grove, and visit the wondrous Yosemite Valley, as yet an arduous journey from San Francisco, but it will soon be within easy reach.

I see that my writing is very bad, and will stop short.

Inclosed are seeds of the two passion-flowers which are so good for showing the movements of tendril, both the coiling after being touched, and revolution, etc. Sow in April in your little conservatory, or in hotbed, and you may have good plants for your purpose in June. The tendrils show off best under a temperature of 80° or 90° Fahr. P. acerifolia will give you tendrils a foot long, when in full growth.

I note the uneasiness in England, and the rumors of difference in the cabinet, — dangerous times for Gladstone's ministry, but I do hope it will last.

I suppose your church is all in order, and your cares over as to the rebuilding. . . .

TO JOHN TORREY.

November 4, 1870.

I have to-day a long letter from Bentham, which I would send to you, but that it is full of Compositæ queries and statements, which I have soon to attend to. What a worker he is, and what a good one!

At last accounts Decaisne and Brongniart were drilling. Rather old sojers, I think! Cosson[1] had dispatched his wife and daughter and granddaughter to England, and was communicating now and then by balloon-post! Bentham very well, and working hard at Compositæ for "Genera." . . .

I have an advanced class this year, and they come

[1] Ernest Cosson, 1819–1890. Wrote the *Flora of Algiers* and the *Flora of the Environs of Paris.*

up here, and take up a vast deal of my time. But it is enjoyable work, as they are the pick of a dozen out of fifty or sixty of the preceding year.

March 28, 1871.

. . . I hope, with you, that the Domingo annexation will break down. But Grant is working for Cuba too, and that is worse than the other; ignorant blacks are better than Creole Spaniards to deal with.

TO R. W. CHURCH.

February 27, 1871.

. . . There are so many things I wanted to write about your church (for which it was shabby of me not to remember and send you a contribution, in a small way) and the reopening services of which you sent us a newspaper account; your "Anselm," which we read aloud in our deliberate way, on successive Sunday evenings, when not interrupted, and very much enjoyed; I think the later chapters most; perhaps because we got more interested as we went on, perhaps, too, the narrative flows on with a more free movement in the later than in the earlier chapters. Then there is this wonderful German-French war, which is only now closing, if it be the close, in such bitter humiliation of the French as no Frenchman could ever imagine possible, nor any but a German contemplate without deep sorrow and pity: all their hard measures of former generations meted out to them again, to this one hapless generation, in a way that till now it could never have dreamed of. For long years France must play a secondary political part, which of itself will be a bitter thing, we may hope a wholesome thing; and when with long care

and nursing of resources she recovers, she cannot be so strong relatively again, while the German empire holds together. And I suppose you in England have a good deal of misgiving as to what this Germanic power portends. Perhaps the next great wonder, and surely the best thing, may be a great defensive alliance of English-speaking people round the world, which would render any European continental changes less momentous.

It seems to me that the hopeful prospect for France is in the ascendency, seemingly assured, of the conservative republicans and the Orleanists. But there are rumors that even the Orleans family are falling out among themselves.

As I grow older I can sympathize thoroughly with a disinclination you may feel as to assuming any new public duties. The deep ruts which the daily routine of life has worn for us do become such pleasant paths, as one ages, that we do not thank anybody for trying to force us out of them.

Nothing have we heard or seen of Mr. Horner yet: he has gone South probably, which is wise. I hope he will come this way in June, when we shall be very glad to see him. . . .

By the way, I see in "Popular Science Review" a neat presentation of Wallace's points on the limitations of natural selection as applied to man, by Buckle (I suppose your Oriel friend), who makes the point very well that these limitations apply hardly less, in their way, to other parts of the animal kingdom.

I am too much occupied with humdrum botanical work to read or think much of such matters.

Have you read or seen Bryant's translation of the

Iliad? It was discussed in our club last week by my neighbor, who read extracts from this, Lord Derby's, and other translations: it was thought to be as readable as Lord Derby's, to adhere quite as closely to the original, and to reflect more truly the simple directness of Homer, both of expression and thought. I should like to know what you think of it.

The most important matter, as concerns myself, is, that I am busy with plans of building, having found a man who is disposed to give the money for constructing here, adjacent to the herbarium, a much needed botanical lecture-room and laboratory for students. Between the herbarium (which, you know, adjoins our house, and communicates with it) and the conservatory, there is a space of 127 feet. This we mean to fill up: First, with a one-story brick building 60×38 feet, rather less than one half for botanical laboratory and cabinet, the rest lecture-room; then a lobby, and the remainder of the distance a low stove and a short, cool greenhouse, to establish connection with our present hothouse. Then, on the one hand, I can bring plants at all seasons into the lecture-room; and on the other I can reach the same under cover, from my private study, through the herbarium; and Mrs. Gray may walk, in winter, from her dining-room, through our little drawing-room, entry, library or parlor, my study, greenhouse corridor, herbarium, lobby, laboratory, lecture-room, passage, stove and coolhouse, into conservatory, of three compartments, a long affair, but don't imagine anything at all grand. A snake, of which our house is the head and the farthest wing of the conservatory the tail, will give the best idea. In a lucky time I asked a man to build in this 127 feet, at an expense of at least twelve



THE RANGE OF BUILDINGS, BOTANIC GARDEN IN 1893

thousand dollars; and I am authorized to get plans and estimates complete, and I suppose it will be done, though I have no positive assurance of it yet. I thought you would like to know it, without waiting till all is absolutely settled.

Here is a second sheet filled: thick paper, too, and I must cut all short. How I wish we could be with you in Switzerland next summer!

Ever yours affectionately, ASA GRAY.

TO CHARLES DARWIN.

March 10, 1871.

MY DEAR DARWIN, — It is very good of you to send me, and so kindly address, a copy of your new book,[1] which safely reached me two days ago. I have not yet had time to read any of it, except the preface and the ending; and I do not like to dip into it and so blunt the edge of curiosity. So I keep it well out of sight, not caring to look just yet at any of the pages which you think likely to "aggravate" me, until some day I can get a good pull at it. . . .

April 14, 1871.

You have such a way of putting things, and you write in such a captivating way. One can only say: —

Almost thou persuadest me to have been "a hairy quadruped, of arboreal habits, furnished with a tail and pointed ears," etc.

But I have read only the first part of the book and the closing chapters; have left all the Sexual Selection till I can read it leisurely next summer, and

[1] *The Descent of Man.*

have lent it to a judicious friend, who has just returned it.

I have been besought to write notices of the book, but I decline. You don't know how distracted I am in these days, — doing the work of professor, gardener, builder, financier, and what not, all at once.

But I must not let this mail pass without sending you the little I could get as to Laura Bridgman.

Through Dr. Jarvis, a medical man, etc., I got the queries put to the woman who has now the personal charge of Laura, and he brought me the inclosed, which I think I should not much rely on.

When Dr. Howe is on hand, some day, I will see if I can get anything authentic and particular, — not, I fear, in time for you.

TO CHARLES WRIGHT.

CAMBRIDGE, June 28, 1871.

. . . Well, I say the same as then, only I feel sad about the chance of the "Flora of North America." What is my bête noire, as I said before, is the care of the Garden; and till I can get rid of that, by some complete reorganization, which shall result in the Garden's being much better seen to than it has been, — better taken care of and better named up and superintended, — I shall not be comfortable nor of much use in writing "Flora of North America."

I am going to try if I cannot find or make some sort of superintendent, and pay him out of what I pay for rent of house, and have succeeded in getting credited to Botanic Garden fund. This will leave me to pay for work in the herbarium (which is the work you prefer) out of the only $800 a year yielded by herbarium fund, which has first of all to pay for books, paper,

fuel, and freights,— in short, most of it, and some years all, — must come out of my own pocket, until I can find somebody who will endow a curatorship. Or else I must put this work in the herbarium on to my assistant, Farlow, who, however, will have his hands full enough without it.

As to the way you are doing up Cuban botany, I do not find fault with it. I think, with you, that you are doing about the best possible thing under the circumstances. The only thing that you may justly complain of me for, I think, is my sensitiveness and pooh-poohing new-species-making in families where old species are yet all in a jumble, and where I have thought that you could not yet tell what were new and what old. I dare say I have been too impatient about it, and I see I have hurt your feelings somewhat, which I am sorry for. I only meant, take time and pains to clear up the old ones in the books, and get a better assurance, if you can, about the proposed new ones. But, after all, it is wrong and foolish in me to worry myself, or you, about them.

You will have more experience of the sort, in the working up of your San Domingo collection. But if we can get time to refer doubtful cases to say Oliver at Kew, and some one at Paris (where they have many old San Domingo plants), I suppose you may get them pretty straight. . . .

TO R. W. CHURCH.

September 10, 1871.

I have addressed the envelope for this letter before writing it, determined to use once more the familiar superscription. The official may bide its time.[1]

[1] Mr. Church had been appointed dean of St. Paul's, London.

Only yesterday we learned of Gladstone's doings by a newspaper slip sent us by a friend who knew of you through us on the Nile, Mrs. Howland. But I had a sort of premonition of it and was on the look-out. . . .

I do not know where the Deanery is, — not in so attractive a situation as Whatley Rectory, one may safely say. But I suppose you are not expected to reside there in summer, that you will be fairly able to have some country quarters to your liking. And there is Switzerland always within reach. Happy mortals, who can reach the Alps within forty-eight hours, and with only a narrow, though proverbially nasty, bit of water to cross! But what we hope to gain from this upturning is to see you over here. When Mr. Horner returns (we have heard nothing since they vanished in the West) he will tell you it is no formidable matter even to cross the continent. At least you can come and see us, make us a long visit, and be as quiet here as in a Swiss wayside inn, and sally forth upon an excursion when you like.

Please thank Mrs. Church from me for thinking of us, and writing the very next day after this anxious matter was concluded. It is wonderful she could find time, with so much to do and to think of. And such a full account of the Swiss journey, too.

I owe you letters, too, — one at least lies reproachingly in a drawer of my table, where it was thrust a long while ago along with many others which could be postponed; but once postponed it is not easy to overtake them.

Say to Mrs. C. it is not a part of our house which was moved; that would not have been difficult, for it is of wood (though the herbarium, etc., adjacent is of

brick). It must have been the Law School the moving of which Mrs. Gray was describing. Tell Mr. Horner that, like some other things, when once you have seen it done it ceases to be wonderful or even difficult.

As to my lecture-room, etc., all work stopped for near a month, including the fortnight or more when I was away; and now (September 11) all has been clatter and hurry for the last week or so, and they really seem determined to fulfill the terms of their contract, to finish by the 15th instant. They cannot do that; but I trust the workmen may go out with the month. These cares of building have sadly interferred with scientific work all summer. I have accomplished very little of what I intended. I attended, and, when the last year's president retired on delivering his address, presided over, the American Association for the Advancement of Science, twentieth meeting, at Indianapolis, capital of the State of Indiana, — a journey of forty-eight hours, in very sultry summer weather, over long stretches of country. I broke the journey by a day in New York, to see two sons of Mr. Darwin just as they landed, and by a three days' stay, including Sunday, with my old friend Mr. Sullivant, in Ohio. The meeting was a pleasant, though not especially interesting one. I met botanical correspondents of many years' standing whom I had never seen. At the close we were invited to make an excursion to the Mammoth Cave in Kentucky, which I counted on seeing. But I found that the excursion was to be an overcrowded one. . . . So I hastened homeward, and was with Mrs. Gray at Beverly Farms, where she had been passing holidays at Mrs. Loring's at the paternal homestead on the seashore, — a place

that you have heard us talk of not a little. It is delightful. I know nothing to give you so good an idea of it as the Devonshire coast, there being plenty of wood quite down to the water. Were we there now, Miss K. and Charles Loring would, I know, charge me with messages.

I must tell you that the Scientific Association is invited to meet at San Francisco, California, next summer; and that we have fixed the meeting there conditionally, that is, in case the Californians care enough for our presence to transport a certain number of our representative men free of cost, or nearly so, across the wide continent. If not, we are to meet on the northern part of the Mississippi, — at Dubuque, Iowa, far enough west in all conscience, but a place from which we may easily reach the Falls of St. Anthony and Lake Superior. I must needs attend, as I shall have a retiring address to deliver. And though I can ill spare the time or afford the expense, yet Mrs. Gray and I are longing to see California. What say you and Mrs. Church about joining us for your next summer's vacation? The mountains which form the sides of the Yosemite Valley will hardly offer as many kinds of flowers as the alpine turf of the Riffelberg, but they may be more novel to you. . . .

On December 15, 1871, Dr. Gray wrote to President Eliot, after describing formally the completion of the new buildings, and something of the history and arrangement of the department, the following letter:

. . . I beg to add, for your consideration and that of the corporation, a few words of a personal character.

With the present academic year I shall have com-

pleted thirty years of service in the professorial chair to which I was called in the spring of 1842. The Garden, which had been under no professorial care for years, and which has since had a long and hard struggle for existence, the conservatories, the herbarium and its library, both steadily increasing, and now the lecture-room, laboratory, etc., make up an establishment which has grown by degrees into one which requires much time, care, and anxiety to administer, and for which I have now done the main part of what could be expected of me or any one man. The experience of the last and the present year clearly shows me that the work of instruction, steadily increasing in its demands under the present system, weighted more and more with the load of administration, is more than I can carry on. I have some warnings, besides, of the increase of years, which I ought to consider; and I definitively propose to lay down, at the close of the present academic year, as large a part of this load as I possibly can without serious prejudice to this department and this establishment. I suppose that either the duties of instruction or of administration, beyond that of the herbarium, must be entirely surrendered. If I can be spared, and if what I could do for the herbarium could be reckoned an equivalent for rent of the house I reside in, I should crave to resign both the charge of the Garden and of the professorship. There is reason to think that the time is at hand when changes such as are here suggested may be propitiously made.

When I came here, in 1842, I was carrying on and publishing a most important original work, the "Flora of North America." I have worked on it from time to time, but I never have been able to publish any

more of it. And now what was done has all to be done again, and carried if possible to a completion; and there is no one else to do it if I do not. My educational books, or most of them, require to be re-edited; and I fail to find time and sufficient freedom of mind for the undertaking. If I could accomplish these tasks, or a good part of them, I am of opinion that I should in consequence be able (as is especially my desire) to do a great deal more for the university and the permanent interest of this establishment than I can expect now to do, as at present situated, even if it were possible or probable that I could so continue for any length of time. I am,

Very respectfully and truly yours,

ASA GRAY.

TO JOHN TORREY.

CAMBRIDGE, January 4, 1872.

DEAR DOCTOR, — I have a horrid cold, which makes me unwell.

I write a brief line, in response to yours of yesterday, mainly to say that I fear I disagree with you about the reply to be made to Wilkes's urgent request to print the manuscript of the Oregon collection of Wilkes' Expedition.

It was prepared to print long ago; is not your fault that it has been delayed so long. The library committee have a right to print it, and might do so without your corrections if you decline to make any. We want the plates, which are now thrown away, and must be published. I would print in the form of a naked list, — except where remarks and descriptions are still wanted, — and to make all right and sure, and to relieve you, I, with Watson's kind help, will

fix it all up for you and read the proofs once, and so save you the worry. And I urgently request you to send this line to Professor Henry, as embodying my opinion, and my offer of help.

I am sure that if the rest of my manuscript is called for, I shall turn it over with satisfaction, though the same applies to it as to yours. And I should either alter accordingly or add notes.

The rest of your letter I will respond to in due time.

But I feel concerned to have those Oregon plates out.

I think I have some right to, as I paid for one hundred of them; but that is no matter. They are now neither published nor unpublished, which is a bad state of things.

Dr. Gray had the manuscript prepared some years before for the second volume of the "United States Exploring Expedition," and notified the library committee that he was ready for publishing. Meantime came the war, and there was no money or thought for such things. When the country was again quiet and prosperous, the library committee who had formerly known and been interested in the work and its printing had passed away; there was no one to care for it, and the manuscript was never called for.

TO CHARLES DARWIN.

CAMBRIDGE, March 7, 1872.

Mr. Packard, one of our best entomologists, a most excellent and modest man, has asked to be introduced to you, that he may pay his respects.

I shy or refuse such applications generally, saying

you can rarely see visitors or callers. But Packard is "fish to your net," has his head crammed with facts bearing on derivation, is a disciple of the Hyatt-Cope school, that you may have heard of, — people who have got hold of what they call a law, though I do not see that they contribute any vera causa at all.

If you will turn the world of science upside down, you must expect that people will wish to see you. . . .

May 31.

By the hand of an old correspondent of yours, and cousin of ours, Mr. Brace, I send you a little book, which may amuse you, in seeing your own science adapted to juvenile minds.[1] In some of those hours in which you can do no better than read, or hear read, "trashy novels," you might try this instead. It will hardly rival "The Jumping Frog," and the like specimens of American literature which you first made known to us. . . .

TO A. DE CANDOLLE.

BOTANIC GARDEN, June 10, 1872.

MY DEAR DE CANDOLLE, — You must set me down as a faithless correspondent. Your pleasant letter of April 6, from Paris, has been long upon my table, and I think there is one of older date somewhere below. But all this spring I have been so overworked that I could respond only to the most necessary letters of business, duties of my professorship, of the Garden, and many other things. Well, my lectures are over, and for the ensuing year I may hope for some emendation. I give up the superintendence of the Botanic Garden, which has become a great burden, and I

[1] *How Plants Behave.*

nominally devolve other university work in part upon an assistant, surrendering at the same time a part of my salary, hoping thereby to purchase time. We shall see if it be possible. But I have to begin with a new assistant, who will need training; but will then, I hope, take much off my hands. My youthful assistant of the past two years goes in a week or two to Europe, to study in some German university for a year or two; to Strasburg, I think, unless he first should go to Sweden, and there study Algæ, with Agardh, if he will receive him. He takes a fancy to lower Cryptogamia. His name is Farlow, an honest, good fellow. He will most likely be in Switzerland in the summer; and I shall give him a letter of introduction to you, whom he will wish to know. But take no trouble on his account, except to introduce him to Dr. Müller, from whom, as a working lichenologist, he could learn much.

Well, Mrs. Gray and I are going to set out, two weeks hence, for California. We both need the change, and are curious to see the country, having never seen even the Mississippi! The scientific meeting was to have been held there; but there is now a hitch about it. We go, however, at all events, and expect to pass a month in the Yosemite Valley, and elsewhere in the mountain region. I wish you were here to go with us. Hooker was counted on to go with us; but the very bad state of his mother's (Lady Hooker) health, and the state of affairs at Kew prevent it. . . .

I hope soon to receive your "Mélanges historiques," which are sure to interest me. If I can I will write you a long letter from California, or Utah, or the Rocky Mountains! — more interesting than this scrawl from yours ever,

ASA GRAY.

TO JAMES D. DANA.

June 22, 1872.

My dear Dana, — I fancy you have got hold of a good topic for your handling, and have a promising inquiry before you, in coördinating cephalization and natural selection as operative on the nervous system of animals. I expect you to get something interesting out of it.

But every now and then something you write makes me doubt if you quite get hold just right of Darwinian natural selection. What you still say about struggle not applicable to plants makes me think so.

Suppose the term be a personification, as, no doubt, strictly it is. One so fond as you are of personification and good general expressions ought not to object to what seems to me a happy term.

Speaking from general memory, I should say that the term, as used to express what we mean, was introduced by the elder De Candolle and applied in what I thought a happy way to the vegetable kingdom. I cannot drop it because you say there is no struggle where there is no will; perhaps you mean without consciousness, and then the field of struggle will be much limited. But call the action what you please, — competition (that is open to the same objection), collision, or what not, — it is just what I should think Darwin was driving at. Read "Origin" (4th ed.), pp. 72, 73, and so on, through the chapter, especially pp. 81–86.

This is enough to show you that when you speak of "Darwinian struggle" as occurring only "when the faculties of an animal are called into requisition," you take too limited a view of what Darwin means.

For myself I should say that the faculties of the lowest animals and the faculties of plants were

equally called into requisition in the case, in a manner so parallel that there is no drawing any but a purely arbitrary distinction between the one and the other.

I conceive one as effective as the other as regards the leading on and fixing variation.

When I say now again that the expression "fitted by its regional development to the region" conveys no clear meaning to me, I am only telling you, as I did before, my way of looking at things, not finding fault with yours.

By the way; "variation (inherent) in particular directions," is your idea and mine, but is very anti-Darwin. Good-night. A. GRAY.

Dr. Gray greatly enjoyed his visit to California, with the long overland journey thither. It was an ever-renewed excitement to see plants growing which he had seen only as dried specimens, and the conductor of the train was at last almost in despair at the scattering of his passengers to grab what they could in the short halts, as they became inspired by seeing Dr. Gray rush as the engine slowed, to catch all within reach. Then when in motion again the specimens were brought from all sides to see what they were. And the preparing and drying went on to the wonder of some and the interest of all.

His ascent of Gray's Peak was made a great occasion in the neighborhood. A large party gathered from Georgetown and Empire City, and started the afternoon before, after having been most hospitably dined by Judge McMurdy, in Georgetown; the night was passed in a mining-tavern cabin, and the ascent, some going on horseback, some on foot, was made the

next morning. Speeches were made on the summit, and resolutions passed to confirm the names Gray's and Torrey's peaks given in 1862 by Dr. Parry, who was himself happily with the party. The ascent is not as difficult as in most mountains of that height, as one can ride on horseback to the top in August, when the snow lies only in patches; the trail is mostly over the rough shale, and for a month or two the summit, though over 14,000 feet, is almost bare. The view of the innumerable peaks is very magnificent.

At Dubuque he was the guest of an old Fairfield comrade. As the retiring president of the American Association he gave his address,[1] written mostly in the cars on the long overland journey, in which he explained still further some of his long-meditated conclusions on the distribution of the flora of Western North America.

TO R. W. CHURCH.

CAMBRIDGE, October, 1872.

MY DEAR CHURCH, — I promised to myself, if I did not to you, that I would write you from the other side of this continent; but writing and journeying are incompatible, at least in case where the time for the one is too short for your undertakings. But now we have been a month at home, and more; the accumulation of things to be seen to is worked off or nearly, and I mean now to tell you something of our summer's doings.

As soon as we were free we set out. . . . At Chicago we had two nights and a day in which to see the desolated and fast rebuilding town. From this

[1] "Sequoia and its History; the Relations of North American to Northeast Asian and to Tertiary Vegetation," in *Darwiniana*, pp. 205–235.

place, over a thousand miles west of Boston, we made our proper start. . . . A welcome rain cooled the air and laid the dust that morning, and not a drop more of rain did we see, any more than in Egypt, from that day onward, until, six or seven weeks later, we were back at the eastern base of the Rocky Mountains, when there was an evening thunderstorm, and the next morning I called Mrs. Gray to the window to see a novel sight, — the streets dripping and muddy! I wish I could describe to you our journey, and the sort of life we were leading. But if I go into particulars there will be no end.

At Omaha we were on the Pacific Railroad proper, and soon upon the plains, at first the larger part cultivated, but barer and drier as we advanced westward, and ascended imperceptibly; so that the next twenty-four hours brought us, with some fine views of the range, to the foot of the Rocky Mountains and a height of 5,000 or 6,000 feet above the sea; that afternoon over the Black Hills of the Platte, 2,000 or 3,000 feet higher, and the highest elevation of the road, — higher than the passes through the Rocky Mountains beyond, — and at nightfall we were traversing the wide grassy Laramie Plains, a vast, sequestered sub-alpine meadow. And when I rose early next morning, we were running through a dry desert "sage brush" (wormwood) region (desert, except for the botanist, — the first plant I saw and clutched proved to be Grayia), the scanty waters of which run into the Colorado of the West and the Gulf of California.

Another twenty-four hours, through grand scenery, brought us, after three nights in our car berths, to Ogden, on Salt Lake, where we took a branch road and, skirting the lake along the whole eastern shore,

reached Salt Lake City, the Mormon town, before sunset. Here we passed two nights and a day, and enjoyed scenery worth crossing the ocean for, and saw something of the strange life of the district.

Back to Ogden; two more nights and days, one long day crossing the Humboldt desert, rendered passable only by the Humboldt River, which, though the ragged mountains all run north and south, yet runs from east to west and marks its course by a narrow line of greenness, and at dusk we saw its end in the Humboldt sink, a lagoon without outlet on the western verge of the basin, against the Sierra, the arid side of which we were ascending all night, to awake among pine forests at sunrise; to breakfast upon the very summit soon after; to descend through most striking scenery into the great valley of California, and, traversing that and the Contra Costa range, to see the head of the Bay of San Francisco at dusk; to cross the bay in a steam-ferry, and reach our hotel in San Francisco at ten P. M., — a journey full of interest, not a bit monotonous or dull, from first to last. There were fatigues and small discomforts, of course, but these are all forgotten long ago, and the whole transit dwells in memory as one continual and delightful piece of pleasant, novel, ever-varied, and instructive sight-seeing. Of course the identifying at sight, as we flew by, of flowers new to me in the living state, and the snatching at halts, and the physical features of districts which I had always been interested in, and knew much about but had never seen, all gave me occupation and continual pleasure. But it was much the same with all the party. Even the return journey was hardly less interesting. . . .

From Dubuque we took steamer up the Mississippi

River, through its finest scenery up to St. Paul, Minnesota; saw the falls of St. Anthony and Minnehaha; thence, while the rest of our party essayed Lake Superior, Mrs. Gray and I returned home by rapid stages.

I have only to-day finished the study and laying into the herbarium of specimens I gathered and dried, regretting the while that I did not collect more specimens and many other species, as I might have done.

Tyndall is in Boston, and I trust will be with us next week. I have not yet seen him, nor Froude, nor even MacDonald, the third lecturing notability in Boston.

TO CHARLES DARWIN.

CAMBRIDGE, October 6, 1872.

You delight me by your promise to take up Dionæa and Drosera now, and I imagine you as now about it. Good! And I am so glad you will take that opportunity to collect your botanical and quasi-botanical papers. These, with the Dionæa, etc., will make a nice and most welcome volume.

In answer to your query, I think I can "support the idea," or the probability of it, "that tendrils become spiral after clasping an object from the stimulus from contact running down them." For though some "tendrils do become spiral when they have clasped nothing," others do not. The adjustment of the unstable equilibrium is more delicate in the former, so that it starts under some inappreciable cause or stimulus. That the stimulus may be so propagated downward is clear in the sensitive plant, where the closing of the leaflets in succession will follow the closing of the ultimate pair under slight and

local irritation. And in the tendril the coiling below is just a continuation of the same movement or same change as that which incurved the tip in clasping, that is, a relative shortening of concave or lengthening of the convex side of the tendril. Would you not infer that the action was propagated downward?

So you were astonished at Mrs. Gray's audacity. Well, "toujours l'audace;" she is all the better for it. Some horseback work in getting to and into the Yosemite Valley was severe, but she bore it so well that I ventured, when we made our detour into the Colorado Rocky Mountains, to take her up to the summit of Gray's Peak, 14,300 feet, or thereabouts, where she acquitted herself nobly. The day was perfect, the success complete, and the memory of it one of the most delightful of the many pleasant memories of the whole journey. Our great trip was the round from San Francisco to Mariposa Grove, Yosemite Valley, entering over Glacier Point, from which (tell your sons) is a new trail down the 4,000 feet into the valley; made excursions from the valley during several days, and returned by a long sweep through the little Tuolumne grove, round foothills to Murphy's and the Calaveras Grove, and so back to San Francisco. Afterwards Mrs. Gray and I went to Santa Cruz and up the San Lorenzo Valley among noble redwoods, rivaling the Sequoia gigantea. On return we made one stretch to the east base of the Rocky Mountains, then down to Denver, and up into the mountains, to 8,400 feet, where we had a pleasant week or more (just the climate to give strength to an invalid), whence I climbed a high mountain or two, among them Gray's Peak, the highest, as already mentioned. Thence we came down to Dubuque and hot weather, on the Mis-

sissippi to St. Paul and St. Anthony, etc., and then home by rail, having been twelve busy weeks away.

Well, we are longing to do it again, and more! But I am settling down to my work as well as I may, well content with the summer's holiday.

December 2, 1872.

Well, it is wonderful, your finding the nervous system of Dionæa!!! Pray take your time next spring, and do up both Drosera and Dionæa. I will endeavor next spring to get hold of Drosera filiformis and make the observations. I will also do better, by sending your note on to Mr. Canby, who lives near its habitat, and has done something already in such observations.

As to coiling of tendril. I think your idea is that in the coiling of a fixed tendril, one coil has its concave side the opposite of the part that has coiled the other way.

Now take a piece of tape say a span long; black one side, let some one hold the two ends while you twist in the middle. The two halves are coiled in opposite directions, just as a tendril which has caught does. The same color will be on the outside of the coil all the length.

Blacken with a stroke of paint a line along the whole length of a caught tendril. On straightening it out the black will be all on one side.

I have not had time to follow it up, and need not, since you are sure to do it. But I think it clear that one and the same side is concave, that is, the relatively shortened side, the whole length of the caught tendril. Do not you?

Mrs. Gray is absent while I write, or she would add her best regards and best wishes to my own for a happy New Year to you all.

TO C. W. ELIOT.

BOTANIC GARDEN, CAMBRIDGE, January 1, 1873.

MY DEAR PRESIDENT ELIOT, — Will you kindly present the inclosed communication to the corporation at its next meeting.

I need not say to you that I could not take so serious a step as this without much consideration, and that I would not do it if I were not confident that the department which I have served in the university for almost thirty-one years need not now suffer by my withdrawal. I am warned also by growing experience of the fact that the needful work which I could formerly do with ease can now be done only by effort, followed by exhaustion and other unpleasant effects, which may be expected to increase; and it is clear that I have left to me, at best, barely time enough, when rigorously economized, to complete the works for which I have long been pledged, and without the accomplishment of which my life will have been largely a failure. The corporation will perceive that I do not intend to be idle, but to concentrate what energies remain to me upon the kind of work for which I am best — and indeed peculiarly — fitted, both by disposition and by more than forty years of preparation. As this work proceeds, the herbarium of the university, always requiring attention during its continued increase, will be put into the condition in which I should leave it, with its value greatly enhanced. In view of this, and of the fact that the herbarium forms an important part of the apparatus of instruction here, I trust the corporation will think it reasonable to allow me the possession of the house I live in, in recompense of my services as curator of the herbarium.

I offer my resignation unconditionally, that the corporation may have, as it should, the whole matter in its hands without embarrassment. If it be desired to keep my name for the present upon the catalogue, and especially if the corporation should prefer not to place a permanent incumbent just yet in the Fisher professorship, I would in that case take the liberty to suggest that the present very capable and efficient assistant, Dr. Goodale, be made adjunct professor of vegetable physiology, with salary assigned from the Fisher professorship. I remain, dear Mr. President,

Very sincerely yours, ASA GRAY.

Messrs. the President and Fellows of Harvard College:

HONORABLE AND DEAR SIRS, — The time has arrived when I may, as I think without detriment to the university, retire from the professorship to which I was appointed in the spring of 1842; and I hereby tender my resignation of it, to take effect at the close of the present academic year, when I shall have completed thirty-one years of service.

I trust that I may still be useful to the university; and if agreeable to the corporation I should like to continue to be Curator of the Herbarium. With sincere regard, I am your obedient servant,

ASA GRAY.

BOTANIC GARDEN, CAMBRIDGE, January 1, 1873.

TO A. DE CANDOLLE.

CAMBRIDGE, January 14, 1873.

MY DEAR DE CANDOLLE, — I am much and long in your debt, — all the more by your agreeable letter of the 16th ult. . . .

Let me note points in your letter. Your volume of

"Mélanges," etc., has not yet come to hand, — but it is sure to come in time through the Smithsonian Institution, and will be received with welcome. I will see to the reproduction of the article on the Dominant Language of the Twentieth Century, — English of course. I am glad you will make a full index of the "Prodromus" quoad Genera. I wish it had been species, also!

Glaciers in California! Why, there is a fair remnant of one now, on the north side of Shasta, — and more in the southern part of the Sierra; and as to glacial marks, the geologists note them abundantly.

I am glad you saw much of Mr. Adams at Vallon. Madame A. is the more of a talker, is she not? Or, perhaps she does not speak French. Adams is vice-president of our American Academy; and is, I hope, presiding this evening at a meeting which I myself am not well enough to attend. I hope he will become president, for I mean to retire in May. . . .

Dr. Parry passed last summer in the Colorado Rocky Mountains, where Madame and I visited him, in his cabin; and we ascended Gray's Peak together (14,400 feet). Torrey, old as he is, was there later, but did not get up the twin Torrey's Peak, though his daughter did surmount Gray's Peak. . . .

Now about myself. In what time I can save I am assisting Brewer in the "Flora of California," and shall do for him the Monopetalæ, and finish next summer, if my health does not fail.

Moreover, this is my last year of university work. I finish in July, and then resign, and give my remaining time to the "Flora of North America." Although it is so arranged, it is not yet to be announced. It is difficult to drop at once the many things I have charge

of, and the vast correspondence all over the country, which has been very useful to me, and others, but which takes a deal of time. But I am making a fairly good beginning. Mrs. Gray delights with me in the prospect of release from many a care, and of devoting myself without distraction to the work I have always liked best.

I really hope it is not too late to do something (a few lines from you upon this subject might, *entre nous*, be useful to me).

TO ——.

CAMBRIDGE, May 18, 1873.

. . . I cannot object to your maintaining the hypothesis that each and every existing plant and animal form has been directly created (or mediately created, if you see a difference) out of the soil, pure hypothesis though it be, and one which "from the nature of the case can never be directly proved." It is natural that you should hold to such hypothesis as long as you believe it to be possibly tenable.

But what I may ask you very seriously to consider is, whether you are prepared to bear the responsibility you assume in maintaining and teaching that no hypothesis of the derivation of existing "specific" forms from previous ones more or less like them can logically be theistic and religious. How far any such hypothesis may be probable or tenable in view of the evidence is not the question raised, but a far more momentous one.

Consider what the "younger men who learn of you" will be likely to think when they come to discard, as the best informed ones probably will after a while, your scientific views on this subject; but still, per-

chance, confide in your dictum that the doctrine of the derivative origin of one species from another cannot logically stop short of "blank materialism, destructive both of science and religion, and even . . . to morals and social organization."

There will be "a heavy penalty to pay," but there are two sides to the question as to who is to pay a part of it. What I said in the last paragraph of the Dubuque address "we need not here consider"[1] is, nevertheless, worthy of consideration.

The time is not very distant, I imagine, when those who have protested against such reckless statements will be thought to have done some service to religion as well as to science.

I trust that the foundations of theism and of the Christian religion rest upon firmer foundations than the so-called "immutability of species."

[1] "An able philosophical writer, Miss Frances Power Cobbe, has recently and truthfully said: —

"'It is a singular fact that when we can find out how anything is done, our first conclusion seems to be, God did not do it. No matter how wonderful, how beautiful, how intimately complex and delicate has been the machinery which has worked perhaps for centuries, perhaps for millions of ages, to bring about some beneficent result, if we can but catch a glimpse of the wheels, its divine character disappears.'

"I agree with the writer that this first conclusion is premature and unworthy, I will add deplorable. Through what faults and infirmities of dogmatism on the one hand, and skepticism on the other, it came to be so thought, we need not here consider. Let us hope, and I confidently expect, that it is not to last; that the religious faith which survived without a shock the notion of the fixity of the earth itself may equally outlast the notion of the absolute fixity of the species which inhabit it; that in the future, even more than in the past, faith in an order, which is the basis of science, will not, as it cannot reasonably, be dissevered from faith in an Ordainer, which is the basis of religion." — "Sequoia and its History," in *Darwiniana*, p. 205.

TO A. DE CANDOLLE.

CAMBRIDGE, June 12, 1873.

MY DEAR DE CANDOLLE, — I must be in your eyes a disgracefully negligent correspondent and an ungrateful friend. I think, however, that I must have acknowledged the arrival of your volume which I received, I think, in March, — more likely late in February. The attempt at a perusal of it was when, on the 12th March, I went on to New York to pay the last duties to my venerable and good friend and associate, Dr. Torrey. I read a good part of the volume on the railway journeys, and planned a review of several of the articles. Then, a month later, I broke away from my laborious life here, and made a visit to my old friend Professor Henry, at Washington. I even went as much farther south, to Wilmington, North Carolina, where I met the spring in all its beauty, a month in advance of our tardy north. I collected a lot of live Dionæas, etc. I returned to a great accession of university work, my assistant being obliged to leave me on the 1st of May.

To return to your volume: I called Professor Henry's attention to it, as one which would all through interest him much, if ever he finds time to read it. He will translate the article on the Language of the Twentieth Century for his Report, and perhaps others.

At a time when I was already overloaded, the death of dear Torrey has thrown some cares and extra work upon me. I have to carry through the press a report of his upon the plants collected in west North America, in Wilkes's Expedition, which was drawn up, but never really finished, twelve years ago, and was called for just during Torrey's last sickness, and to his annoyance, which I felt bound to relieve as well as I could.

Then, six weeks or more ago, died my next oldest friend and companion, Sullivant, making a sad spring and giving me a needed warning to make haste. He again leaves two unfinished works which I must see to, though Lesquereux will, I trust, edit them. Of one, indeed, he was to be joint author. The other, a second volume of the beautiful "Icones Muscorum," is ready as to the plates, but not at all so, I learn, for the letterpress.

For myself, as I think I have already told you, this summer completing thirty-one years of professorial work in the university, I am relieved from further duties of instruction, — and of my salary. I shall not experience the full relief until the very close of summer. For, in the interest of this department of the university, and to leave it in proper working condition, I have undertaken a course of what we call university lectures, — meaning lectures intended the rather for others than members of the university, — and have opened the botanical laboratory to pupils, mainly teachers in schools, for the summer.[1] Considerable time must be given to them, but, after a few weeks, I hope to throw it mainly upon my assistant, Professor Goodale.

Professor Goodale, under appointment as assistant professor of vegetable physiology, will take the whole work of instruction in botany off my hands; but if a former assistant and pupil, Dr. Farlow, now with De Bary, proves capable of it, as I hope, he will, I trust, take up the work in systematic botany. His fancy, however, is for Cryptogamia.

Mr. Sereno Watson is the only one here to do work in systematic botany, but he will not teach. He and

[1] This was the beginning of summer schools in Harvard University.

I are endeavoring to help out Professor Brewer in the "Flora of California," which, to be done at all, must be pushed through at once. I have promised to do the Gamopetalæ, which come in the field I am striving to cover for the "Flora of North America." That work I hope now to give myself to.

I ought to have taken this step several years ago; but I could not afford it, and it is only now that I have been able to bring the department here into the position in which I feel justified in resigning the care of it. I retain the charge of the herbarium, and I continue my residence in the house which is connected with it.

Dr. Torrey's herbarium and library were made over to Columbia College, and will be kept up, although no professor will be appointed at present.

Mr. Sullivant's bryological collections and library are to come here.

I send you by mail a copy of my biographical notices of Torrey and Sullivant; both from "American Academy Council Report of Proceedings," and both printed in advance, in "Silliman's Journal," where you will see them.

By the way, I have resigned the chair of the American Academy, after ten years' occupation, and it is taken by Mr. Adams, whom you know. The third class (classical and historical) takes its turn.

TO W. M. CANBY.

CAMBRIDGE, June 30, 1873.

MY DEAR CANBY, — My Dionæas grow finely, and are the delight of my heart.

Drosera longifolia, also cultivated, is almost as good a fly-catcher.

Now and then I see a little exudation inside base of

hood of Sarracenia flava, which answers to what my Southern correspondent pointed out; but is not very marked. . . .

CAMBRIDGE, July 7.

. . . I have also seen here that water is secreted in the pitcher of Sarr. flava before the lid is open.

But I have also seen some time ago, when the weather got rather warm, very minute globules like finest dew on the erect part of the lid, near base, inside. And, lately, during the very warm days, I found in some this increased, and the droplets running together into a clammy exudation. But I want to see more of it. I shall watch, as I get a chance, and the weather gets hot. Look at yours. See if there is anything of the sort in S. purpurea; I think not.

I have not the book yet. But I somehow understand that this exudation on the lid is mentioned in the English translation of Le Maout and Decaisne's "General Treatise of Botany!" The French has it not. Very likely it has been found out by Darwin, who finds out everything!

. . . *Conundrum?* Why does the Dionæa trap close only part way, so as to cross the bristles of edge only, at first, and afterwards close fully?

Darwin has hit it. I wonder you or I never thought of it. A. G.

TO A. DE CANDOLLE.

CAMBRIDGE, October 27, 1873.

MY DEAR DE CANDOLLE, — If I were a better correspondent, I should have long ago thanked you for your interesting and welcome letter of August 11, from Samaden. I was in the Engadine when last in Switzerland, and got near the top of Piz Langarde, when a storm drove me back.

Your announcement leads me to expect soon the new (and alas, last!) volume of the "Prodromus." Well, it must give you a huge sense of relief to have it off your hands; something like the relief I now feel at the termination, at the close of thirty-one years, of my professorial duties, upon which you felicitate me. On account of a summer course of instruction, which I felt bound to initiate for my successor, I did not really close my labors until the end of July. Since then I have been able to work at systematic botany very steadily. We took, my wife and I, a holiday of a fortnight, in which we visited friends on the Hudson River and its tributaries, at the close of September, just as the foliage was beginning to display the bright autumnal tints, which this year have been unusually gorgeous, and have not yet disappeared, although the leaves are now falling fast. The sight is most enjoyable to me in the earlier autumn, when the verdure still prevails and makes a setting for the red, yellow, and russet.

I am now deep in the Compositæ for the "California Flora" of my friend Brewer, and so am trying Bentham's work. It generally holds good, — wonderfully so, considering its extent, and the comparatively short time he took for it.

Your agreeable volume of "Miscellanies" is now in the hands of your old friend and my neighbor, Jules Marcou; who asked to borrow it, having been unable to purchase a copy. It is reported out of print. I think I sent you a light article I wrote for the "Nation" last summer,— I believe in June, — in which I gave an abstract of your essay on the Dominant Language of the Twentieth Century. It has attracted considerable attention. I see that those who have

studied the subject think that the increase of population in North America is not to go on at the rate it has been going; that the check is already apparent.

A week or two ago appeared in the "Nation" an article (sent to you last week by post), in which I had occasion to notice some other parts of your volume, at considerable length. I have also been tempted to give some account of your essay on Natural Selection as applied to man; but I find it would take me too much out of my own line, and absorb time which I cannot spare. Indeed, I have only looked over that essay, and am not qualified to abstract, still less to criticise it. The longest article of the volume, which gives the title, I have not given as much attention to as I ought, probably, or I should perhaps value it more highly. But it seems to me that membership in scientific academies — the three you take not excepted — is so largely affected by circumstance, irrespective of talent and of the value of work done, that one cannot very confidently base general conclusions upon the data. Yet I have no great confidence in my opinion. Anyway, the article is full of interesting matters. . . .

What do you and Dr. Müller say to Bornet's memoir, on the nature of lichens? His exposition is so clear that, if he is an honest and good investigator, — as I cannot well doubt, — his conclusions carry conviction.

My sheet fills, and leaves now barely room for Mrs. Gray's messages of kindest remembrances to yourself and to Madame De Candolle, in which I beg to join. Long may you flourish, and much good work yet do. For one thing, pray print the list of botanical names! Ever yours, A. Gray.

November 26.

. . . I am going this morning to witness the nuptials of my colleague and friend Professor Sargent and a charming young lady of Boston; and, on the chance of their having a day in Geneva, I wish to introduce the happy couple to you and Madame De Candolle. They will tell you much of me, and of the satisfying and I trust useful sort of life I am now leading. Some evidence of renewed botanical activity in the form of a couple of botanical papers just issued here, too bulky to send well by post, I will cause to reach you by way of Paris.

Professor Sargent is given to horticulture and arboriculture. He not only takes charge of the university Botanic Garden, but also of a recent and noble foundation for an arboretum, from which much may in due time be expected.

It is most pleasant and hopeful when, as in the present instance, a young man of means and best social position chooses to devote his time and energies to practical scientific ends, rather than to business or pleasure. You are more accustomed to that at Geneva than we are here in America.

I know that, before this can reach you, I shall have occasion to write to you, and to announce the reception of the last volume of the "Prodromus," now on the way to me. So I have only to add that I am always Very sincerely yours,

ASA GRAY.

TO CHARLES DARWIN.

May 12, 1874.

. . . I sent to Hooker to forward to you two articles in the "Nation," on Insectivorous Plants, written to

reclaim your work from Bennett, who began to appropriate it, etc., etc.

It is already leading to discovery. A physician in Carolina, a good observer, already writes me that in S. variolaris, the best of Sarracenias, he thinks he finds the watery liquid anæsthetic (??) and the sweet secretion not. But he says there is a line of sweet, a trail, running from the sweet rim down the edge of the wing outside nearly to the ground, which lures up ants (with which Wyman tells me the pitchers are crowded), just like the train of Indian corn which hunters scatter along the ground to lure wild turkeys into the trap! Does not that beat all!

Also my articles here resulted in the discovery related in the paper inclosed. The take-off of Thomson's germs from another planet is good.

June 16.

. . . The gratification I feel in learning (by yours of the 3d) that you are pleased must, I am sure, exceed any satisfaction of yours in regard to my subdued and quiet article in "Nature."[1] Lockyer, to my great surprise, applied to me for it, and of course I could not refuse. I think it will generally be regarded by scientific people as just and moderate.

Odd that you should not have recognized my hand from the first in the "Insectivorous Plants," written, in fact, to vindicate your rights. The papers called forth a second hoax, as elaborate as the first, and much better done. I have no idea who wrote them.

You must, meanwhile, have received the article in the "Nation," reviewing Dr. Hodge's "What is Darwinism?" You see what uphill work I have in

[1] "Life of Charles Darwin," in *Nature*, June 4, 1874.

making a theist of you, "of good and respectable standing."

Do hurry up the book about Drosera, etc. My plants of Sarracenia variolaris, having lost their spring growth in transmission, have not yet made any that is satisfactory. So I begged Dr. Mellichamp, who had sent me leaves with gorge sanded over at the sweet-secretion part, to send some for the trail. He wrote me it was too late in the season; they were all drying up. But this morning, with the inclosed postal card, came several with the sand sticking fairly well to the glutinous line, and I send you one of them. I wish I could send you Mellichamp's long letters, about the two sorts of larvæ, that appropriate, one the upper, one the lower part of the pitcher.

My wife (who sends her love to you and yours) is much amused by your backgammon reminiscence. For the year past we have a way of getting on most peacefully. I sit by her side and play solitaire with two packs of cards, she looks on and helps, and when we don't succeed there is nobody to "flare up" against but luck. Ever yours, A. GRAY.

P. S. — I think I never sent you my felicitations upon your election as Foreign Honorary Member of American Academy Arts and Sciences.

We are proud to number you among the seventy-five (too many). And, I may tell you, only two negative votes were cast, one by an Academician who made a speech on the occasion, to which nobody vouchsafed a word of reply. A. G.

CAMBRIDGE, June 19, 1874.

MY DEAR DARWIN, — Your second letter reached me last evening, and this morning came from the

publishers some copies of the number of "Nature." You seem as pleased and are as ingenuous as a maiden when she first finds out that she has an admirer!

Now I am a little vexed, as I am apt to be when I let anything be printed without reading the proof myself. Some one has doctored one sentence, and made it say the contrary to what I wrote, and to what is true; I make the reclamation on a separate sheet: and also another, which may be typographical, but which I am confident I could not have written; I surely wrote "*to* many," not "*in* many."

My claim for you about teleology I have made several times, in "Silliman's Journal," [1] and elsewhere. It is a matter on which I have a good deal insisted. Yours affectionately, ASA GRAY.

P. S. — My *point* (which is *blunted*) was to show how very near Brown came to "hitting the nail on the head" without hitting it, striking wild instead!

A. G.

TO W. M. CANBY.

July 6, 1874.

I am glad if you have Darlingtonia in a state to examine. I have some young leaves growing, which show nothing yet. Mellichamp will send me a paper, which I will read at Hartford next month. Won't you post up Darlingtonia also — getting what you can from Lemmon. He has not written to me about it. My young fish-tails show no exudation yet; and they are colored like the rest of the leaf.

Ever yours, A. GRAY.

[1] See vol. xxxiv. n. ser., November, 1862, pp. 428, 429. — A. G.

BOTANIC GARDEN, July 8, 1874.

DEAR CANBY, — Yours of 7th instant received. I thought you had live Darlingtonia. Of ours the old plant has died after starting three new offsets. But the growing leaves are small. If it goes on I may do something. Thus far I have detected no water in the tubes, nor any sticky secretion. But I shall slit one soon. Make notes for Hartford.

You have not guessed the conundrum, though you have made a step in distinguishing the two different movements. I 'll tell you. It is to strain out the small flies. Do you take? Or want details? I send you Darwin's late letters, — one came this evening. We have lost all those Pinguiculas.

Can we get any from Wilmington now? Are there any near Dr. Mellichamp? You may forward Darwin's last letter to him and set him to observing, — collecting and preserving leaves with insects stuck fast, and margin turned over. See if ours turn over the edge!

How does D. find out they digest?

July 14.

When Dionæa is irritated by a small fly, he has plenty of time to escape through the meshes, and the leaf soon opens, ready for better luck next time. Think what a waste if the leaf had to go through all the process of secretion, etc., taking so much time, all for a little gnat. It would not pay. Yet it would have to do it except for this arrangement to let the little flies escape. But when a bigger one is caught he is sure for a good dinner.

That is real Darwin. I just wonder you and I never thought of it. But *he* did.

Pretty good, — the solar protector! So Fendler is near you. Remember me to the good fellow.

I wish he had let Cosmical Science alone! But now he never will, and is a gone goose.

Ever yours, A. GRAY.

Dr. Gray, being sent away for a cough, made a journey to Apalachicola, Florida, going by Washington, Augusta and Tallahassee, of which and his successful search for Torreya he wrote a lively account for the "American Agriculturist," republished in his "Scientific Papers," selected by C. S. Sargent.

He was especially interested in seeing Torreya, a fine tree named for his friend Dr. Torrey, which is only known in one or two localities in Florida, on the banks of the Apalachicola River; and with some trouble he found it growing, and had the satisfaction of hoping that it was valued enough to be preserved. There is a second Torreya growing in Japan, a third Torreya in California, and a fourth in China. "But," as Dr. Gray says, "any species of very restricted range may be said to hold its existence by a precarious tenure. The known range of this species is not more than a dozen miles in length along these bluffs, although Dr. Chapman has heard of its growing farther south, where the bluff trends away from the river."

He went to Stone Mountain in Georgia, a curiously bare, immense mass of stone, one side too steep to climb, but having in clefts some rare plants growing. From Chattanooga he made an excursion up Lookout Mountain, interesting from its reminiscences of "Sherman's March," and also the habitat of some rare plants he was so fortunate as to find.

TO WILLIAM M. CANBY.

BOTANIC GARDEN, March 13, 1875.

MY DEAR CANBY, — I do not get on, and shall not in this melting snow and bad season.

I yield to advice, and Mrs. Gray and I are going South, — I do not know where, but somewhere, taking my vacation now instead of in summer. I want to find now — and reach comfortably — what we have here at the first of June.

You know somewhat of the South; I think I should like best to get to Apalachicola and St. John's River and see Torreya. But it seems far off.

I want to recruit, and to be good for something, which at present I am not!

SMITHSONIAN INSTITUTION,
WASHINGTON, April 25, 1875.

MY DEAR CANBY, — Well, we have got back again, so far; and here, I think, we shall stick for a few days. Had we anticipated so much cold and backwardness, we should have stayed south longer.

Apalachicola was heavenly. But at Macon, coming north, we struck the cold wave; came on by Atlanta (Stone Mountain), Chattanooga (roots of Silene rotundifolia), and thence via Lynchburg straight here. I found Torreya, and had a good time with it. Lots of detail to tell you. . . .

I am lazy in traveling, or I would have written you. Then I have been pretty busy, too, and have done several hard days' work, causing much but healthy fatigue.

CAMBRIDGE, May 8.

We are at home, with delightful memories of you and yours.

I think I hinted to you that I found two Crassulaceæ on Stone Mountain, both annual.

One, most abundant on the lower slopes, is glaucous-green, and has bright white flowers. The pods show it to be a true Sedum. I send a small specimen. Note the blunt pods and short style. This — as shown by a bit of fruit in my herbarium — is Sedum pusillum, Michx.!

The other is dull purple in general hue, smaller, grows only well up the mountain, abounds in a small form on the very top, and is rather later; but I make out the dehiscence, and it is Diamorpha pusilla, Nutt.!

The specimens you sent to me are this, larger and later than any I got. But, as you directed me to the base of the mountain for Diamorpha, you must have got this too. Your specimens have full-grown fruit. Look at them and see if the larger ones have not the regular dehiscence down the side of Sedum, and let me know.

May 12, 1875.

Thanks for your letter and the Sedum.

Now for another find. The moment I set eyes on the Arenaria of Stone Mountain, I said, Ho! here is A. brevifolia, Nuttall, of which I had only a single stalk in herbarium. Comparing now, I was right, and Nuttall says his specimen is from Tatnall County (which is strange, that being in southeast Georgia). The question remains, Is it only a low-country form of Arenaria glabra?

Your specimen — with fruit — and M. A. Curtis's[1]

[1] Moses Ashley Curtis, D. D., 1808–1872. Born in Charlestown, Mass.; early removed to the South; lived near Hillsboro, N C. His botanical studies were largely on Fungi.

from the mountains of Carolina, being in the same state, compare pretty well. I should unite them, only the seeds are different, Stone Mountain plant half the size, and shape rather different. But please rattle me out some real ripe seeds of your plant, for further comparison.

At Stone Mountain I looked rather for small specimens to match with A. brevifolia. I send you a bit.

I have sent the Sedum and Diamorpha yesterday to Paris, to compare and see if both are in Herbarium Michaux.

I am proud of my little discovery!

Ever yours, ASA GRAY.

TO R. W. CHURCH.

CAMBRIDGE, June 22, 1875.

I must indulge, on its rising, the impulse to communicate with you, which a letter from Miss P. to my wife, just received, has awakened.

If I go on as I have been going, we shall come to know nothing of each other. . . .

She will have told you of our loss in the death of Mrs. Loring. I never knew a woman fuller of charity, humility, and good works.

If there were time for a gossiping letter I or Mrs. Gray would give you some account of a trip which we made to Florida this spring. An annoying cough, and a chronic catarrh, — the consequence of a trying winter, acting upon old susceptibilities, — distressed my friends more than it did me. So, yielding to their solicitations, off we went, about the middle of March, to Washington, visiting old friends; to Augusta and Savannah, Georgia; and thence Apalachicola, a now

almost deserted, but once flourishing town, on the Gulf of Mexico. We met the spring in Georgia; in Florida we were in early summer, about like our own middle June.

The botanizing was delicious, very many nice things which I had never seen growing before; our quarters comfortable, and the fare exceptionally excellent. East Florida, which has large hotels, was full of invalids and pleasure travelers, making a crowd not to our liking. I had special botanical objects leading me to west Florida, an out-of-the-world region, where we had everything to ourselves. We were late for the oranges, gleaning the last half dozen from the trees of our friends. My throat is so sensitive that I dare say we shall need to go again next March, and earlier than before. So, if you will arrange to join us, I can promise you a pleasant time, and a real rest.

October 11, 1875.

What a capital article it is which your friend Lord Blachford has published in the "Contemporary" for September, on Huxley's Automata hypothesis!

It is long since I have read anything which pleased me more.

Do you know who is P. C. W., in Article 6, of the same number? He makes one suggestion of some value, that I some day want to follow up.

I am grinding away at my work in the usual manner. We are just in the glory of the glowing autumnal foliage, and making ready for winter. If health holds out, here we expect to remain, at least till spring. . . .

TO G. FREDERICK WRIGHT.[1]

BOTANIC GARDEN, July 1, 1875.

DEAR MR. WRIGHT, — Thanks for your letter. It may be that the time has come in which a collection of my popular articles on Darwinism, etc., would be useful.[2] Your thinking so would go far to make me believe it. But then, you are one of the moderate number of people who have carefully read them, and one of the few who well understand and appreciate them, — because you have given the subject an attentive consideration, — and who are awake to the harm that comes from theologians and ministers denouncing a view that scientific men are more and more receiving as probably true. I should like to know how Professor Park regards the proposition.

I will say that while I am not unwilling to collect them for reprinting, in case they are called for, it would not quite do for me, in the position I occupy (I mean as a man of science), to republish them in a collected form, without entering anew and further into some of the pending questions; to do which would seriously interrupt the legitimate work which I have in hand, and to which I am deeply pledged. I suppose I could add, and should be disposed to add, a note or two, — especially one upon teleology from a Darwinian point of view, — a subject upon which there is something still to be said, though I do not see the way to say it conclusively. You will probably do it better than I ever can.

At present, I think I should let them alone, unless there comes what you ministers recognize as a call for them, and such a call I should defer to.

[1] Rev. G. Frederick Wright, then a clergyman at Andover, Mass., now professor at Oberlin, Ohio.

[2] The book was published with Mr. Wright's assistance.

If such as Professor Park and yourself were to ask it, I would see if a publisher could be got to take them up. But you don't know how I dislike to have my name bruited about.

Dr. Peabody was very glad of the relief you gave him on Sunday week, and like myself was greatly pleased with your thoughtful discourse.

August 14, 1875.

. . . The important thing to do, is to develop aright evolutionary teleology, and to present the argument for design from these exquisite adaptations in such a way as to make it tell on both sides; with Christian men, that they may be satisfied with, and perchance may learn to admire, Divine works effected step by step, if need be, in a system of nature; and the anti-theistic people, to show that without the implication of a superintending wisdom nothing is made out, and nothing credible.

Now for a month or two, I am pressed by daily technical work to the extreme, and get no chance to turn these matters over in my mind.

I don't want to handle this argument in such a way that it can be gainsaid, nor without touching the very point. May I ask you to help me? You see how the question stands. How shall we best handle it? . . .

September 14, 1875.

. . . I have been crowded and much absorbed with my part of the California botany; get put back, by new collections, and have had the printer on my heels, which is not pleasant.

I have to drive with all my might, and am not yet clear, though I trust the worst is past. I get so fagged

that when I sit down to Darwin's "Insectivorous Plants," by way of relaxation, of an evening, I fall asleep over it. And so have not finished that book yet, as it cannot be read with the eyes shut. I put off thought of all but my daily work till my task is done.

I thought I might have got up to see you, but I cannot now.

I see in the last "Nation" an article, which was evidently to have been continued, by Chauncey Wright, in which he points out clearly the essential difference between Darwinism, which is scientific, and Spencerism, which is "philosophical." Save the mark!

Poor Wright, — your namesake — died suddenly of apoplexy, Sunday morning. He was a stanch Millite, and very acute and clear-headed.

September 15.

. . . A minister out in Illinois has written me, taking me seriously to task for altering my opinion after the age of forty-five, and for abetting disorder, by supporting theories that disturb the harmony of opinion that ought to prevail among scientific men.

He is one of those people who think that if you shut your eyes hard, it will answer every purpose; indeed, from the ease with which he confutes Darwinism, I suppose he finds no call even to shut his eyes.

November 10.

. . . Species, as I have said (in "Silliman's Journal" articles) are not facts or things, but judgments, and, of course, fallible judgments; how fallible the working naturalist knows and feels more than any one else.

That the pages of a Flora or Fauna should give

the idea of fixity and clear limitation which does not well or wholly represent the reality, is natural enough; is, indeed, inevitable. The object in these works is to set forth the differences, and put them in the strongest and clearest light, so that the forms may be readily discriminated. The nearer two forms are alike, the more pains the naturalist takes to set forth the differences, while the likeness "goes without saying," and is therefore overlooked by the outsider, though it may have been almost an even chance that the describer merged the two in one.

The thoughtful and experienced naturalist does not get a wrong impression from all this, but the outsider almost certainly will. A. G.

January 14, 1876.

Dear Mr. Wright, — Thanks for your line of the 8th.

By this week's "Nation,"[1] you see that, long as the talk is, I have not yet touched the critical question, nor have I yet got an opportunity to apply myself to it. But I hope to do so soon.

Meanwhile, the number of the "Westminster Review," which you called my attention to, has passed through my hands in our book club, and I shall soon have it in my hands again. It makes a very strong presentation, and the question is, how its points are to be met on purely scientific grounds. If I can meet them fairly, and reëstablish the evidence of design on the basis it ought to stand upon, I shall be satisfied and happy. Anyway, it is a help to me to have this able presentation brought before me. . . .

[1] Review of *Darwin's Insectivorous and Climbing Plants*, in *The Nation*, Nos. 549 and 550.

May 21.

. . . I have here and there seen references to St. Augustine as maintaining views of indirect creation, such as now would be termed, or might be termed, evolutionary. Can you conveniently put me in the way of understanding his ideas? It is matter for you to work up in your article on Calvinism and Evolution. . . .

December 20.

. . . Do you see No. 1 of the new agnostic weekly, "Evolution," and its review of "Darwiniana"? It insists that such a world as ours is too full of imperfections to have had any intellectual originator. . . .

TO JOHN H. REDFIELD.

July 1, 1876.

DEAR REDFIELD, — I doubt if you know that the late John Stuart Mill, the philosopher, was a keen botanist. His herbarium, rich in European plants and with a good many Indian, etc. (small specimens from Royle, etc.), was given by his stepdaughter to Kew. But Hooker asked leave, after taking a certain amount, to present the rest to me, with leave to choose where all I did not care to have incorporated in the herbarium here should go to. I think it should go to a public herbarium, and as I think the Academy's is not supplied well with European species of at all recent date, or recent collecting, perhaps it should go to you. . . .

TO MRS. GRAY.

June 11, 1876.

. . . To get my train yesterday I had to leave the house at one. Dom Pedro till sixteen minutes of that,

with Eliot, A. Agassiz, and two Brazilians. They came to the house, the door being open, and I received them in the library. . . . Sargent was with me to take him off my hands when I had to go. We treated him as we should any gentleman, though I believe I once addressed him as Your Majesty when flourishing the poison-bottle under his nose. He is a large, square-built, good-looking man of about my age, I think. Never did I have more questions to answer in ten minutes, nor questions more direct and to the point. Taken into the herbarium, he recognized what it was, complimented me by saying that my name was a well-known one (I suppose Agassiz had put him up to that), and I returned by saying that, in at least one case, we were members of the same botanical society.

"How many species of plants have you specimens of?" About 65,000.

"How do you arrange them?" Cases opened, and I began to show him.

"Please let me see some plant."

I pulled out the genus cover first at hand, which happened to be European Saxifrages; opened. He took up a sheet.

"Saxifraga irrigua, European. I do not want to see plants of Europe. Let me see an American plant."

I took another cover and showed Saxifraga peltata of California.

"Have you Sage-brush?" Yes.

"Let me see Sage-brush."

I took him across the room to the Artemisias, and showed him, first, the one he saw so much of en route to California; second, the northern one to which Lewis and Clark gave the name at first.

"How do you prevent insects from destroying them?" They are all poisoned.

"What do you poison with?" Corrosive sublimate dissolved in alcohol.

"How do you use it?"

Here I ran off and brought back the poison-bottle, and applied the liquid to a specimen under the imperial nose.

I then ran off to set down the bottle in a safe place on the middle table, when he followed me up and asked:

"How strong do you make the solution?"

I gave him the answer as well as I could, when he turned to one of his suite: —

"Please write that down."

And it was done accordingly. In the library I had displayed, enough to attract the eye, the bound volumes of "Flora Brasiliensis," which he glanced at, and asked: —

"Have you the work on the botany of the vicinity of Rio Janeiro?"

I answered, Yes, thanks to Mr. Agassiz, — to whom the emperor had given it.

But he seemed uneasy until he saw it, and I put two of the folio volumes into his hands, which seemed to satisfy him.

Then, as he was passing on to the lecture-room, I slipped off. At head of Common, in Boston, I met C., who told me Dom Pedro was down at his museum at $7\frac{1}{2}$ A. M. C. was not going to Hunnewell's. . . .

I amused them with the account of the conversation with the emperor.

The rhododendrons, and azaleas too, most splendid. Nothing like it at Philadelphia. The best as well as the most he ever had. . . .

TO R. W. CHURCH.

August 3, 1876.

It is very good of you to write to me. I was about to drop you a line by the next post, when yours of the 21st came in.

My special object was to tell you that I have just had addressed to you, through the New York publishers, a little book, made up of scattered papers on Darwinian topics, which some of my friends thought it might be useful to collect. I somewhat mistrust their judgment, but have yielded to their request. There is nothing new in the volume, except a short essay on the hypothetical duration of species, and a rather long one at the end, upon teleology as affected by evolution, which I should be glad to have you read, and should like to know whether you think it hits the mark.

I have no idea who P. C. W. and the Westminster Reviewer may be, but I suspect they are one and the same. If you should know, please inform me. . . . Yes, it has been warm enough, and it was unceasingly so for twelve days. Mrs. Gray rushed to the seashore at Beverly; but I mainly stayed at home, kept out of the sun all I could, and rather enjoyed the heat than otherwise. But at the end I broke down; came all at once upon the novel sensation of being an old man. And so we hastened up and concluded an arrangement which had been left loosely and vaguely under consideration, viz., to revisit for myself, and to introduce Mrs. Gray to, the higher Alleghanies in Virginia, Carolina, and Tennessee, where I used to roam and botanize more than thirty years ago. We expect to set out in two or three weeks. It is not Switzerland, but it is a region of mountains, dells, and rills,

and forests, which I have been longing to revisit. Oh, that you could be with us! Two botanists will join us at Philadelphia, and perhaps a third.

Among the very few copies of my "Darwiniana" which I have sent to England is one to the editor of the "Spectator," whose ideas fit in with mine well, as I judge from reading the paper regularly. Do you know him? He is a very broad churchman.

I am just beginning to print a portion of my new "Flora of North America." There can be no going to Europe for me till this volume or half volume is off my hands.

Dr. Gray enjoyed greatly the journey through the North Carolina mountains, and the traveling and accommodations were almost as rough as in the journeys thirty-three and thirty-five years before. The people, still cut off from the lower lands by roads that were mostly only used for horses, and where one traveled sometimes two or three days without meeting a wheeled vehicle, were very plain and primitive in their ways, and one had to depend at times on their hospitality for accommodations. But the scenery is striking and beautiful, and the forest unsurpassed for the magnificence of its grand trees, rich in variety and beauty. The party went first to New River Springs, then to the French Broad Hot Springs, and round by a rough journey to Asheville, then far away from railroads, where they were joined by Dr. and Mrs. Engelmann, and continued through the mountains to Cesar's Head, whence they made their way by railroad through South Carolina and Georgia to Jonesboro; from Jonesboro going up Roan Mountain, a camping-out excursion.

TO CHARLES DARWIN.

December 5, 1876.

. . . Curious that one species should take pains to close fertilize some flowers, the other to cross all. . . .

Now I want to beg of you to consider about a name for this kind of thing, on which, as a good judge, you could consult Bentham, or indeed, Hooker, if he can give it attention.

This matter will need to come into generic or specific characters, and therefore wants a terse and unambiguous mode of expression in a single word.

My old expression thirty or so years ago, "dicœciodimorphous," you reasonably objected to, implying separation of sexes (which, though, it need not do).

Yours of "dimorphous" should be, as the lawyers say, void for vagueness, there being plenty of other kinds of dimorphism in flowers.

Hildebrand's, of "heterostylous," the difference being in other things as well as style, and, I think, possible sometimes not in the style. The term will not work well in characters, whether in Latin or English. I have proposed, accordingly, in a little article not yet published, to use the term "heterogone," in other form "heterogonous," in Latin "Flores heterogoni," with the counterpart "homogone," "homogonous," "Flores homogoni."

This means, you see, explicitly, diverse genitalia, and the γονή is used as in the common botanical term "perigonium."

TO R. W. CHURCH.

February 5, 1877.

Your friend Lord Blachford is an unrivaled expositor. I have just been reading, with extreme sat-

isfaction, his article on the Reality of Duty. That naturally brought you to mind, and I vowed I would no longer be so negligent, but would acknowledge and thank you for your letter of August last, and for Professor Mozley's sermons. They are excellent indeed, and it is saddening to have a man of such insight laid aside by illness, of a sort which probably does not diminish his desire, but destroys his power, to work. . . .

I think Mrs. Gray has given some account of our summer vacation. I long to revisit those mountains when the Rhododendrons and Kalmias are in bloom, and to have your company.

We are just home, Mrs. Gray and I, from a fortnight with our friends at Washington, — a pleasant holiday, which of late I have always had at this season, the time of the annual meeting of the regents of the Smithsonian Institution, of which I am one of the lay (i. e., non-congressional) members. It makes a break in the monotony of our winter, which is far milder there than in New England, and the society at Washington is very pleasant. More and more men of mark, and intelligence, and cultivation reside there, at least for the winter months. We left on the day when the contested electoral count began, under the arrangement so happily and hopefully adopted. There is no excitement, and, outside of partisanship, little care which way it is determined, but much that it shall be legitimately determined by evidence, argument, and a decisive judgment.

I am deep in routine botanical work, and with a printer not far behind me, I can think of little else.

TO G. FREDERICK WRIGHT.

CAMBRIDGE, April 6, 1877.

DEAR MR. WRIGHT, — What can I ever have said or written which President Fairchild takes to mean that I have the preposterous idea that "changes of environment take place in distinct and definite lines"! He may well ask if "this is not contrary to all evidence." Even the conception that variation takes place in definite, or at least not in indefinite, lines is an idea which is rather thrown out as tenable, and as inferable from a good many facts, than as anything to swear by. I think so, yet, I am sorry to say, it is no part of Darwinism, pure and simple.

Now, in my turn, what does President F. mean by his "mere fact" "species exist"? That seems to me no fact at all, but an inference. Individuals exist; species are inferred from the relations the individuals are observed to sustain to each other. That species are distinct, in the sense of none blending, is what working naturalists would like to have somebody settle for them in many a troublesome case. That they always have been as much so as they are now is the question under consideration. . . .

May 24.

. . . Now we can't go to see you, sorry to say. The reason is, that I am working against time. Hooker is coming over, and we are going in summer to the Rocky Mountains together, according to an old promise of mine. To do it I ought to complete the printing of the part of my "Flora" which I am upon, else I shall suffer in various ways, and there is great danger that I fail.

. . . Do you notice — I know it will please you —

how Kingsley caught at my essay, which was reprinted in England long ago; see his memoirs.

1877.

I would say to President Fairchild something like this:

Where only one individual out of a thousand or a million can survive to maturity and propagation, clearly only the very best adapted to the environment will so survive; and in somewhat different environments, only those best adapted respectively to the two, three, or more different environments. The intermediates, i. e., those least particularly adapted to the two or three different emergencies, surely have least chance.

Now our species of plants and animals are the comparatively few surviving lines of a great number of lines which have come down through long and various periods of great tribulation, in the literal sense of the word; they have been ground over and over, first on this trial, then on that, leaving, as it seems to me, no chance of the survival, side by side, of all sorts and shades of intermediate forms. Hence, under this, and the general law of heredity, the practical distinction of species and genera appears to be a natural result.

That low, and even the lowest, forms of life should survive and abound all down the ages, and be the most widely diffused over the earth, seems also the most natural result, being simple adaptations to simplest conditions of air and water, so nearly the same the world over. These are still far most numerous in individuals, and have, so to say, the surest hold on life. When we think of the vast void below which

the " improvement " out of their sphere of these would leave, and the increased risks which complicated structure (in machines or beings) has to run, we shall not wonder that the simple still numerically predominate.

TO CHARLES DARWIN.

CAMBRIDGE, June 10, 1877.

MY DEAR MR. DARWIN, — Except when you are to be aided in your work I decline to give letters of introduction to you, knowing how you are occupied and how infirm your health at any time may be. So please take this note to mean just this. The happy couple who bear it would be delighted to call some day, if you say so, and pay their respects to you, and I will tell you why I am disposed to promote their wishes.

Mr. Burgess[1] was a favorite pupil of mine, and is a young naturalist of much promise; not in my department, however, but in entomology. He takes particularly to the anatomy of insects, draws capitally, and shows talent for research, which we trust will bring forth good fruit. I cannot blame him if his modesty and caution have kept him back from publication as yet, but he has time before him, and even a sight of you will be a stimulus to his ambition as well as something to remember in after years. I need not say that he takes to Evolution; all young naturalists of any good do. He has just married the daughter of my dear old friend, the late Mr. Sullivant, who did for muscology in this country more than one man is likely ever to do again. The young lady is very dear to your good friend Mrs. Gray and to me; and, as you have more than once made a remark com-

[1] The afterwards famous designer of yachts.

plimentary to American ladies, and as you are such an excellent judge, I must even give you the opportunity of extending your range of instances.

But please do not give our young friends the opportunity of calling upon you, unless it quite suits you.

By the time this reaches you, Dr. Hooker will be on the way to us, we expect, and we are looking to have a great run together over the Rocky Mountains, and perhaps across the Continent. Wherever we may be, you may believe me,

Always yours cordially, ASA GRAY.

TO A. DE CANDOLLE.

CAMBRIDGE, June 4, 1877.

MY DEAR DE CANDOLLE: . . . I meant to have a good portion of my "Synoptical Flora of North America" to send you this summer; but it will not be quite ready at the time I expected, and I am now likely not to have this summer for writing, but rather for observation over a considerable range of country. Dr. Hooker, it seems now almost certain, is coming over in a month from now. Dr. Hayden has invited him and me to join his expedition of exploration this year, or rather to make a survey of much of his ground in the Rocky Mountains; and it is possible we may even reach California. I am rather old for this work, but judging from last year, I may well endure and enjoy it. Would that you could join us!

We are in essential accord as to subgenus and its nomenclature. Your letter to Cogniaux discusses and decides — as I had done for myself — the questions propounded. You will see I follow it out consistently in my part of botany of California, while Watson was

at sea in his, and would hardly be convinced by my arguments. But he tells me he is convinced by yours.

October 19.

. . . Our journey of ten and a half weeks, with Hooker, was a most enjoyable one, every way prosperous, but laborious. Colorado to the borders of New Mexico, a little of Utah and the Wahsatch mountains, and extensive traveling in California, as far south as Monterey, and north to Mt. Shasta. On return, I had Hooker's copious collections to name up. I made only small and special collections, and most busy we were kept till, on the 6th inst., I put Hooker on the steamer, which, as telegraph tells us, only yesterday reached Queenstown, so he will be landing at Liverpool to-day, — a full fortnight from Boston to London. I am now busy enough with bringing up arrears of correspondence and affairs, and studying some collections which will not wait. Only by the end of this month shall I get to resume my regular, but long, interrupted work. Mrs. Gray accompanied us, and enjoyed it much, enduring well the occasional camp life and such hardship as there was. You should come over, and we will repeat the journey, but only three years hence. Much as I should enjoy it, I cannot spare the time sooner.

I found myself quite equal to younger people in mountain climbing. . . .

TO GEORGE ENGELMANN.

CAMBRIDGE, July 4, 1877.

DEAR OLD E., — Never mind if you are seventy; Hooker is sixty, and I am between, and we are lively yet.

Perhaps we young fellows may knock about rather faster than you like, wanting to do much in a little time. But then, you need not do so much in Colorado as we; take the easy part. . . . I shall be sorry if you fail us.

We must twine in Cuscuta, as we twine in the rest of the book. For real accuracy we must finally come to the terms I propose, entropic and antitropic. We can't get watch-hands into a good form for the description of order, genus, etc.

Be sure I 'll keep you posted. Should like to go to Iron Mountain.

WAITING ON RAILROAD FROM CAÑON CITY TO PUEBLO, July 21, 1877.

. . . If this flowering Euphorbia is the one you asked for I have made good specimens. The round-leaved one is on the hills, and is not yet out; is not the one, I am sure.

We had yesterday a good day (with Brandegee)[1] at the Arkansas Cañon; it is grand, surely.

To-day Hooker and the Stracheys drive across and down Wet Mountain Valley to La Veta (two long days), while we, Mrs. Gray, Dr. Hayden, and I, return by railroad to Pueblo, and thence to La Veta, by sunset to-day. To-morrow up to a camp on La Veta Pass of Sangre de Christo Mountains, which Captain Stevenson is preparing.

Our English friends begin already to feel in a hurry, and for a wonder I am the hold-back member of the party. . . .

[1] T. S. Brandegee. Engaged on railroad surveys in Colorado and Washington territories and the Northern Pacific. At present living in San Francisco.

SALT LAKE, August 8.

I have yours of the 30th July, and I return inclosure. Write hereafter to the Palace Hotel, San Francisco.

I trust, and expect, that the strike days are over, and that you will severely punish the ringleaders.[1] Glad you have had nice weather; but you have no air like that of Colorado and Utah. . . .

Well, much as we miss and want you, yet we should have hurried you too much. We want to go over a good deal of ground cursorily, rather than a little thoroughly and leisurely.

I do not write you about the oaks at Cañon City, because we had nothing new to say. We agree with you in the complete running together of the oaks down to Undulata. There is one very large-leaved state, looking very different; but it is mostly on fast-growing shoots, and no doubt is a state of the "Q. alba, var." of Torrey. "Alba" indeed! But we did not find the entire-leaved form at the cañon, and Brandegee said it occurred only at the mouth of the cañon, and near the city.

From Cañon City we — Mrs. Gray, Hayden, and I — went in one day south to La Veta by rail, and the next day, toward evening, up to La Veta Pass, 10,300 feet, and over and 300 feet or so lower, where we camped, nice tents having been provided by Fort Lyon en route, and other furnishings from Fort Garland. Abies concolor abounded, though there was more of A. Menziesii (Picea pungens) and Pinus contorta, and a good amount of P. aristata and P. flexilis. The A. Menziesii at that elevation is less prickly, sometimes almost as soft as A. Douglasii to

[1] The bad railroad strikes of the summer of 1877.

the touch, and cones inclined to be shorter. The result is, we think we can trace A. Engelmanni into A. Menziesii. What say you to that?

Botanizing up there and in Sangre de Christo Pass good, but only moderate; nothing new, and no great variety. We enjoyed camp life very well; but after three days broke up, and went over to Fort Garland, and thence, while the ladies and General Strachey went off to a Mexican village, we had a two days' trip up the Sierra Blanca. Alpine plants the same as on Gray's Peak, but scanty, owing to more southern latitude and greater dryness. A longer time and a searching of the interior of this very rough range might, and doubtless would, furnish much we did not see.

Returning from Fort Garland to the railroad, we went back to Colorado Springs and drove up to Manitou. Next day, we went up Ute Pass — nothing — and looked about. Next day, to Garden of the Gods, to General Palmer's to early dinner, and thence to railroad and to Denver. Next day, Denver. Next by railroad through Clear Creek Cañon and to Georgetown, or within a mile, and thence up to Kelso's Cabin, now a well-kept house, to sleep. Next day, Gray's Peak, and I crossed over to the top of Torrey's. Next day, after morning botanizing, came down to Georgetown and visited Empire City and the Pecks. Next day, Sunday, a restful morning, and then by rail back to Denver in the afternoon and evening. Monday, off at half past seven to Cheyenne, and after dinner took railroad to Ogden, and came up here last evening. To-day, a broken day, sight-seeing, etc. To-morrow, we, or some of us, are going south to American Fork Cañon; up that and

over the pass into Cottonwood Cañon; down that, and back here, in time to go on that afternoon to Ogden and thence west to Reno, thence Virginia City, Carson, etc., and the Groves, Yosemite, etc. We shall see, and I will let you know.

Mrs. Gray is out with the party, to see things, and Brigham Young. *I will not.* She would be sending love to Mrs. Engelmann and you, if here. She is very well, and enjoying this travel hugely. I am strong, and ever yours,

ASA GRAY.

YOSEMITE, CAL., August 21, 1877.

. . . So long without touching a pen I can hardly form letters. Did I write to you from Utah? We left direct route at Reno, went to Carson City, with détour to Virginia City, — queer place; first got hold of Pinus monophylla, but there no fruit.

Hired conveyance to take us from Carson right across the Sierra Nevada via Silver Mountain to Calaveras Big Trees, — a good way for studying the tree vegetation, and other, only all other is mainly destroyed by drought and sheep, and the ground is powdered dust. As we struck Pinus ponderosa we were struck with more tapering shape of tree and longer leaves than that of Colorado, so different, and soon, as we rose, by the immense size of cone, ovate, six inches long, very heavy. The big-cone ponderosa has less bright green and rather longer leaves, and cones looking quite different from the ordinary Californian ponderosa, which grows intermixed, except at the higher levels, and has long but narrow cones. Losing the big one as we descended to Calaveras, we come on it again in the Sierra here, when we get up to seven

thousand to eight thousand feet. Here it passes for P. Jaffreyi or Jeffreyi. Is it so? Is it distinct? On bare side of Silver Mountain we found P. monophylla with cones, both maturing and this year's. . . .

CHICO, September 5, 1877.

. . . Thanks for your letter to San Francisco. We are keeping lively; are on the way to Shasta.

What if we were to return via St. Louis: will you insure us against malaria and fever? Want to talk Coniferæ with you. . . .

CAMBRIDGE, September 24, 1877.

We are just back via Niagara; Hooker and I via New York, and the former having the Sunday with Eaton at New Haven. All well and happy to get home after a prosperous and, as you may imagine, laborious journey of ten and a half weeks. The trip to Shasta involved long stagecoach journeys, but they were most interesting. Returning to Sacramento we went on to Truckee, where Lemmon [1] joined us by appointment. We gave one day to Mount Stanford and one to Tahoe, then took the overland train as it came on at midnight, and thence had no stationary bed till we reached Niagara. And we live to tell the story!

I want to tell you what we are led to think about Firs and Spruces. I will give in this my own opinions, which lie yet open, but are likely to settle down, except you convince me to the contrary on some points. Hooker comes to the same conclusions or nearly, but I will keep to my own only in this letter, and ask what you think of them, off-hand. Your reply will come to hand before Sir Joseph sails. . . .

[1] J. G. Lemmon; late botanist of the California State Board of Forestry; author of a report on California Conifers.

Some day you must have a picture of our camp on La Veta Pass. I wish there could have been one of the Shasta camp of the Bidwells.

TO CHARLES DARWIN.

CAMBRIDGE, September 27, 1877.

MY DEAR DARWIN, — Returning from our ten and a half weeks of travel, which has been every way prospered and pleasant, I find your book.[1] I can now barely thank you for it, and for the great compliment of the dedication. I must not open it till Hooker leaves me, a week hence, the work we have to do before we part being so great and pressing. Then I shall turn to it, with enjoyment, and as soon as I can find time I must notice or review it.

Hooker sends his love ; is very glad Cohn has taken up your son's experiments on Dipsacus, which reminds me to send my best thanks to him for the copy addressed to me. For perusal, even for a glance, that, too, must wait till we have worked up the collections and observations we have made in our journey to the Pacific.

Let me add, being sure of your sympathy, that our poor dog Max peacefully breathed his last to-day, after a happy life of twelve or thirteen years. We are glad he lived till we returned, and greeted us with his absorbing and touching affection. In a few days came a partial paralysis, some convulsions, and then a quiet and seemingly painless ending. He is immortalized in your book on Expression, and will live in the memory of his attached master and mistress.

[1] *The Different Forms of Flowers on Plants of the Same Species.*

Max was a black and tan terrier, not remarkable in any way for beauty or intelligence, but interesting from his warm affection and the power it had in developing his intelligence. To be near and to please his beloved master was enough for him. Anything his master did was right and to be submitted to. Max had conscience, but it did not restrain him from showing his vexation when left at home, by throwing Dr. Gray's hat and gloves, etc., on the floor; but his shame and penitence always betrayed him. It seemed as if the joy of his master's return had killed him.

Dr. Gray's next pet was a very small puppy; so small that for the first few months Dr. Gray would drop him into his pocket when calling on certain friends. He was said to be a Japanese terrier, and grew to be a great beauty, with long, white, curling hair (with some black markings) to the tips of his ears and toes, and a tail like a plume, curling over his back, all so fluffy he was given the name of Puff. Dr. Gray always called him a "little pagan dog," because, he said, his conscience was so unequally developed. But though willful and obstinate, with great self-sufficiency, he was very attractive. It was a piece of his mischief as a puppy that called out the following letter from his master to Rev. G. F. Wright.

TO G. FREDERICK WRIGHT.

CAMBRIDGE, December 11, 1878.

REV. SIR, — Will you be so good as to accept a puppy's penitent apologies for his naughtiness, and a new pair of rubbers in place of those which I wickedly destroyed, because it was "my nature to" at the time you last visited my master. I wish you to know that I am as sorry for it as I am capable of being, that I

have been punished as well as scolded, and that the cost of the rubbers has been stopped out of my allowance.

So no more at present from your disobedient,

JAP. PUFF.

Dr. Gray's last dog was a beautiful spaniel, and had the same devoted love for him. He was very courteous and polite, and gentle and affectionate. He needed a great deal of outdoor exercise, and was so disconsolate and miserable at his master's illness, that he was sent to kind friends, where he still keeps a warm and loving greeting for his old mistress.

TO R. W. CHURCH.

CAMBRIDGE, December 26, 1877.

Did I dispatch a line to you on or about October 1st, — one which would have crossed your last to me? If I did not, it shows how a continual and fixed intention works a sense of performance.

I took with me, on our travels, your letter of June 20, expecting to write you from the Rocky Mountains or some far-away Pacific region. But never were such busy people as Hooker and I the whole time. In fact, I was bound to make Hooker see just as much as possible within our limited time, and it seemed on the whole best for us to see very much in glimpses and snatches rather than far less more leisurely and thoroughly. He will have told you of our over nine thousand miles of travel together, and of how he liked it. I think Mrs. Gray and I enjoyed it most, and that we have a particular fancy for hurry-skurry journeying. We should like to do it all over, and more. But especially we should like to see Cali-

fornia in green attire. Not that we are not interested and taken with the sere aspect of these western regions in summer, which we fancy more than Hooker does. In fact, the greenness of England is so congenial to him that he took more delight in our eastern States, which he had mere glimpses of, than in all the wide western region, though of course there was more to learn in these.

How I wish you could have been of the party! We dream of doing some parts again, and of going both farther south and north, three years hence. You and Sir Joseph would not then be too old. But I can hardly expect then to be, as last summer, one of the most active and frisky members of the party.

Moreover, the cost in time is more than one counts on. From the middle of July to the end of September, one may, once in a way, fairly devote to holidaying. But then, after a week or two of work with Hooker over our notes and collections, I had to bring up long arrears, which I should have kept in hand if I had stayed at home, and so I have only now of late come to take up my regular work where I left it in July.

If you do not hear enough of our summer's doings from Hooker, — and I know he must be busy indeed, — we must get Mrs. Gray to write a narrative; not that she is not also a busy soul.

All this time you have had anxious events to occupy your minds, and these are not yet over. But at home you are happy in the recovering health of your daughter after so long suffering.

We had our usual Christmas gathering last evening, and the house is only now set to rights again. Your old friends Miss P. and K. L. were with us, and

we spoke of you. The latter told us that Miss S. proposes to come to us from the West Indies, I suppose in early summer, and glad we shall be to see her.

You never sent me your Middle Ages book; the publishers' fault, no doubt, which I beg you will urge them to make up for. . . .

TO GEORGE ENGELMANN.

May 20, 1878.

. . . That enlarged photograph[1] is for you, to be left for your St. Louis Academy of Sciences, if it ever gets a home, or for the Hortus Botanicus Missouriensis, as you elect. Glad you value it.

I am at new edition of the "Structural Botany," as a bit of ad interim work.

TO A. DE CANDOLLE.

CAMBRIDGE, June 9, 1878.

MY DEAR COLLEAGUE: . . . A copy of the second part of the "Synoptical Flora of North America" should soon reach you, for I was assured at Washington that they were sent at once, and would go to you without delay.

If the "Revue Scientifique de Genève" takes book notices, I shall be pleased if you will notice this publication of mine. I send it to you, and to Boissier; also to Maximowicz of St. Petersburg, but to no one else on the Continent. It is put on sale with Trübner & Company, London, and T. O. Weigel, Leipsic. I have defrayed the whole cost out of my own purse,

[1] Photograph of camp on Rocky Mountains, La Veta Pass, with the best photographic likenesses, perhaps, ever taken of Sir J. D. Hooker and Dr. Gray; and including General and Mrs. Strachey, Dr. Hayden, and Captain Stevenson.

to the tune of $2,050. No publisher would take it, and assume the expense, so I have to carry it myself and botanists must buy it, if they want it. I hope many botanists and libraries will do so; for I must get the outlay back again, or a good part of it, before I go on. Hence, notices in the scientific journals and elsewhere may be serviceable to me.

I will not speak of or count the time and hard labor I have bestowed on the work.

My last visit to Washington was a sad one, to attend the funeral of my dear old friend Professor Joseph Henry, to whom we are all greatly indebted. When I saw him in January, at the annual meeting of the regents of the Smithsonian Institution, it was too evident that he would not much longer be with us.

As may be remembered, Dr. Gray, when in Paris in 1839, found in Michaux's herbarium a plant which he describes as new, giving it the name of Shortia galacifolia, in honor of his old friend Dr. Short of Louisville, Ky. One great object of his later journeys to the southern Alleghanies was the search for this plant. No botanist had succeeded in rediscovering it, and many doubted if Dr. Gray had not been mistaken, though he found among Japanese plants, sent from St. Petersburg, one of the same genus, with a rude Japanese woodcut. It was therefore a great triumph when it was accidentally discovered by an herb-collector, Mr. Hyams, in North Carolina. The next journey to the mountains, in 1879, was planned to search for it especially.

An account of the rediscovery and a description of the plant is given in "American Journal of Science," iii., xvi., pp. 483, 1878. Mr. Sargent repeats the story

in "Garden and Forest," December 19, 1888, and tells how in 1886 he followed Michaux's steps up the Keowee River, in the mountains of South Carolina, farther south than the search had been before, and was rewarded by finding the plant in abundance. Professor W. W. Bailey, of Providence, then sent a note to "Garden and Forest," to say that to Mr. J. W. Congdon, then of Providence, belongs the credit of having sent the first news of the discovery of the plant to Dr. Gray, and tells of Dr. Gray's answer: "If you think you have Shortia send it on." It was sent. Then came from Dr. Gray the characteristic postal, "It is so. Now let me sing my nunc dimittis!"

TO W. M. CANBY.

CAMBRIDGE, October 21, 1878.

DEAR CANBY, — Thanks; glad you can come. You will be notified, if the case comes on.

If you will come here I can show what will delight your eyes, and cure you effectually of that skeptical spirit you used to have about Shortia galacifolia. It is before me, with corolla and all, from North Carolina!

Think of that! My long faith rewarded at last!

Yours ever, A. GRAY.

P. S. — No other botanist has the news.

October 28, 1878.

. . . I wrote to Hyams how much immortality he lost, or rather postponed, for his son, by not sending me that specimen eighteen months ago, so that it would go into "Flora," but that I should make his name famous in "Silliman's Journal," pro tem.

I took the latter end of his letter to be a cancel of

his request to return the specimen. Told him that in May either you or I or both would be down, call for his boy, and be taken to the spot!

I have no objection to give him money for this specimen, if he wants it. But I would not advise that he advertise it. But if he can find plenty of roots, he might legitimately put them on sale, and get a good price. Why should he not?

I did not say, before, that this discovery has given me a hundred times the satisfaction that the election into the Institute did. That caused no particular elation. This has been a great satisfaction.

November 5, 1878.

. . . I send a brief notice to "Silliman's Journal." And I am finishing an account of the matter, which I will send to Paris, to Decaisne, for the "Académie des Sciences," as a "Correspondent" ought.

I have declined to risk the specimen by mail, till we get more, which is not so certain.

November 9, 1878.

. . . He (Hyams) sent me some loose flowers, to help out.

I have sent manuscript to Paris, and shall send back Decaisne's old drawing, and drawing of flower and details, now making by Sprague to be reproduced in the "Annales des Sciences Naturelles," since this ought to please the French.

You can go to see and get specimens, even if I do not. Yet I will go if — at the time — I can.

April 5, 1879.

On April 1 (ominous day) began Compositæ. . . .

TO G. FREDERICK WRIGHT.

April 1, 1878.

. . . I like an article to begin or end with an aphorism, or some sort of snapper. I think you may end your next article with a condensed expression like this: Not vitality but personality is the witness for immortality!

October 24, 1878.

. . . Yes, I read with interest and approval your article on Hypothesis.

I am pressed with work now all this week. I would send you the proofs of Newcomb's article,[1] but you will get it in the "Independent" almost as soon.

Read, mark, and tell me what I should say. I must now lay myself out on this matter. If you will allow, I want to drop, throw out, praying for the weather quoad weather.

I shall take my time, but shall be turning the matter in my mind, at the end of this week and beginning of the next.

Perhaps I may see you on Monday here, unless I am called away.

TO A. DE CANDOLLE.

CAMBRIDGE, January 24, 1879.

MY DEAR DE CANDOLLE, — I have just returned from Washington, where I had to read a memorial of our late secretary of the Smithsonian Institution, Professor Henry,[2] and I have returned somewhat crip-

[1] Articles in the New York *Independent*, signed "Country Reader," by Dr. Gray.

[2] At a memorial meeting held in honor of Professor Henry by the Board of Regents and both Houses of Congress, in the Hall of the

pled by lumbago. I took with me your pleasant letter of the 29th December, intending to write to you from there, but I found no time. The present moment is opportune, as I cannot well move about as I must do in my ordinary work. . . .

I have sent for Saporta's book, and shall study it with interest. Glad I am that your "Phytographie" is in hand. I wish I had it now before me; for I have now to write something on the subject for a new edition of my "Botanical Text-Book," now in hand.

How well Bentham still writes and works! Notice his essay on Euphorbiaceæ. You and Bentham have kept orthodox views of nomenclature at the fore in Europe, and I have seconded them here, so that, except among cryptogamists, heterodoxy makes no headway.

I have some ideas about the best form for Latin specific characters, as distinguished from descriptions, as to punctuation, etc., which I wish to present to you. Perhaps I can best, and soon, do so by sending you proof-sheets.

The link which connected us with a former generation of botanists is broken. Jacob Bigelow, the correspondent of Muhlenberg[1] and of J. E. Smith, as well as your father, died on the 10th inst., at the age of ninety-two. Up to three or four years ago he preserved all his faculties. But sight and hearing gradually failed, and for two years he has been merely alive; at length the candle burned out.

House of Representatives, January 16, 1879, Dr. Gray read a Biographical Memorial of Joseph Henry, in behalf of the Board of Regents.

[1] Heinrich Ludwig Muhlenberg, 1756–1817; a Lutheran preacher in Lancaster, Penn.; published a *Catalogue of North American Plants*, and a *Description of North American Grasses*.

The genus Bigelovia, which your father founded on one species, is now one of the most characteristic North American genera, of many species, chiefly west of the Mississippi.

J. W. Robbins,[1] also of Massachusetts, one of the best and oldest local botanists, died the day before, aged seventy-seven.

Engelmann (two or three years older than I am) and myself are now the oldest botanists of the country, I believe.

While I live I am always your devoted,

ASA GRAY.

TO GEORGE ENGELMANN.

CAMBRIDGE, May 22, 1879.

. . . We go on a trip south to the mountains of Carolina with Canby, Redfield, and this time Sargent. It was to have been done whenever Shortia blossomed. But that stole a march on us by flowering in April. So now we time it for the Rhododendrons, and will see Shortia out of blossom, and we hope to find new stations. Then I want to look up Darbya, of which only the male is known. Curtis seems to have got it, without flowers, near Lincolnton. Then we are to explore the east side of the Blue Ridge, from the base of Black Mountain to Grandfather, and then cross to the Roan, on which is now the Cloudland Hotel.

Oh dear! now that the time draws near, I wish I could stay at home and finish Parry and Palmer's[2]

[1] James Watson Robbins, M. D., 1807–1879; physician at Uxbridge, Mass. "A most critical student of the botany of New England and northern United States, and especially of the Potamogetons" [A. G.].

[2] Edward Palmer; has collected largely in southern Florida and Mexico.

Mexican Compositæ, which abound with new or interesting species! . . .

I send you by mail a copy of my new "Text-Book." You see I relegate to other hands the anatomy, physiology, and cryptogamia, — glad to be rid of them. I send, too, one of the few copies of the Shortia paper. The translator into French in several places missed my meaning. And the explanation of the plate is a botch. I numbered only the floral parts I now furnished, expecting the materials from Herbier Paris to make another plate. Decaisne crowded all on one plate, and numbered to suit himself, and then printed my explanation unaltered. The numbers do not match at all. . . .

TO WILLIAM M. CANBY.

April 25, 1879.

. . . About scheme: it is rather my notion to go via Statesville to Newton, explore down one fork of Catawba, till we find Darbya, or find Curtis's locality, and back by the other; two days. But perhaps, to save time, you would prefer to keep on the railroad from Statesville to Lincolnton (where, by the way, Magnolia macrophylla grows), pick up Darbya, and then come up to us at Statesville or Marion. Then we will see locality of Shortia.

Then, my notion is to get some good searches along the flanks of the mountains, from Swananoa Gap to Linville Falls (find Shortia for ourselves, etc.), and even up to Deep Gap, which you see is pretty well north. Then make Cowles tote us to Bakersville, and then end on Roan Mountain.

There I and my wife would like to stay several days; and you, if it must be, could leave us and get home.

But I am not particular, if you prefer a southern trip; down to Jackson County, etc., and get Vasey's new Rhododendron, — only a day south of where we went before.

Sargent, our director, wants to go, and go in September, so that he can get live things. Perhaps he will join us.

My wife's desiderata are simply these: To see both Rhododendrons in flower, and to get some rough wagon-rides. It seems not difficult to satisfy her simple desires. Moreover, what do you say to our brothers and our nieces, with their aunt? The nieces are trumps of girls for traveling companions, and their father worthy of them. They are enticed by our accounts of Rhododendrons and the nice rough times, and the chance of sleeping in their spectacles, and Roan Mountain, where they would like to stay a week! Perhaps even, we would show them New River Springs with their rocks, etc., on the way homeward.

If they join us, it will probably be after we have done the Shortia and Darbya business.

Is there yet any chance of Redfield? Now you look up routes, etc., and give me your ideas. I wish we had your "heavenly weather."

CAMBRIDGE, July 7, 1879.

MY DEAR CANBY, — Verses seem to be the order of the day. So here goes: —

> With Misses L. the saying runs,
> "However good a man be,
> The most that can be said of him
> Is, He 's as nice as Can-be."

. . . You will want to know how Mrs. Gray and I got on. Finely, with two hard days at the close. . . .

First day, we got round, retracing our old route, to Blaylocks, a hard place.

2d. Traveled all day up the north fork of Toe, through scenery which delighted Mrs. Gray greatly, to head of a fork thereof in Yellow Mountains, and thence over to Cranberry Fork, almost under the shadow of the Roan, or of that prolongation of it which we went to; nice food and lodgings and the luxury of a separate room.

3d. Down Cranberry Creek and up Elk, over Elk Mountain (got Cedronella cordata. Want any?), from which climbed to a good view, down to Valle Crucis, and over to Boone, to sleep; a long day.

4th. Drove fourteen miles, partly on Blue Ridge, to Gap Creek, at noon. Nice house. Very nice wife and children.

5th. Mrs. Gray rested. Cowles and I went up Blue Ridge, saw a fine waterfall on the eastern side.

6th. Took in Mrs. Cowles, baby, and bright little girl. Drove fourteen miles to Jefferson, picnic dinner on the way; stopped with an uncle and aunt of Mrs. C. I and some Jeffersonians went up Negro Mountain; collected Saxifraga Careyana at the original locality; took a view of where Aconitum reclinatum must be, went for it, found it, some specimens barely in bud, more in flower,[1] made specimens for you and for Redfield, took roots.

7th. Cowles and family to wait and visit, while we took their wagon to Marion, forty-five miles, too much

[1] "Dr. Gray, with Mr. Cowles and some of the neighbors, had gone up Negro Mountain. He found on the top the plant he expected, a Saxifraga, made out the narrow ravine he had explored thirty-six years ago, found it, and in its same spot the rare plant (an Aconite) he had then discovered, rarely seen growing since, and so came back triumphant." — Extract from Mrs. Gray's journal.

for a day. (Good souls the Cowles!) But when we had got on six miles, met a wagon from Marion, the men in which proposed an exchange, which we (for the Cowles's sake) gladly consented to. Were to cross the Iron Mountain that day, if time held out (which it did), and stop at a McCarthy's at the foot, twelve miles from Marion. Reaching the place just at dusk, the driver insisted that this nice house was not the place, but a mile or two farther on. So we tired people drove on by moonlight, three miles further, to find he was mistaken, and no lodgings to be had, except possibly a mile further. Came to a house, routed a man and wife out of bed, found a great fire still on the hearth, no decent chance to sleep. Concluded the only way then was to push on the eight miles more, so as to get the train the next morning at 6.35. Got with difficulty a little corn for the horses, brought out Mrs. Gray's tea-kettle, made tea, ate the remains of our dinner, and thus refreshed, jogged on; reached Marion at one A. M., slept till half past five, rose, took train at 6.50. And Mrs. Gray still lives! Were waiting hungrily for our breakfast at Wyethville, when, three miles from it, a slight double thud, a down-brake signal, the last breath of the engine, a stop. To our vast surprise, on looking out, engine, and three cars, and first section of high bridge were missing, and were débris in the abyss. No such accident could have been managed with less shock to the nerves. And as to the result, had it been after breakfast and passengers smoking in the second-class car, there would have been a greater fatality (glad to say, I don't smoke). . . .

There were weak ladies and hungry and sick children on board. I clambered down the embankment

with that blessed tea-kettle, to a poor house, got a fire made, and hot water. Another traveler going farther got a pot of coffee, nice bread and butter and cold boiled ham. And so we fared till omnibuses came for us. At Wyethville a good hotel; got word at length to Shriver;[1] and after a late dinner, an extra train came down, took us to Lynchburg; reached Washington before 8 A. M.

I will send you good specimen of original Saxifraga Careyana from Negro Mountain. Send me a good large one from Roan. I will compare them soon.

TO GEORGE BENTHAM.

CAMBRIDGE, July 4, 1879.

Your last letter has gone to Engelmann, as I notified you; those of May 29 and June 4 overtook me in the mountains of North Carolina, where Mrs. Gray and I were recuperating, but I was kept on the move from morn to night. I could not thence write you on the matters treated of, nor is there anything left to say. . . .

Nature sometimes does what you hit me for suggesting, that is, "take away the essential character," and we have to put up with it, and allow that we may have overrated the character.

But, when all is done, I will try on your view without prejudice, and adopt it if possible.

About Ceratophyllum: I never followed up that early paper, of 1837, because I soon saw that I was very wrong in supposing that the ovules of Cabomba and Nelumbium were like that of Ceratophyllum, and I concluded that my whole idea was baseless. I have

[1] Howard Shriver, M. D., formerly at Wyethville, Va., now at Cumberland, Md.

not looked at the matter since, but I shall be much surprised if you find that my youthful idea is worthy of resuscitation.

We have come back from the cool mountains of the South to really hot weather at the North.

TO A. DE CANDOLLE.

CAMBRIDGE, July 15, 1879.

MY DEAR DE CANDOLLE, — Your pleasant letter of the 3d June reached me on Roan Mountain, in a comfortable little house, at the elevation of about 6,200 feet above the sea, enjoying glorious views of range after range of the Alleghany Mountains, and on the grassy plateau Rhododendron Catawbiense, perhaps more of it than in all the rest of the world, just coming into blossom. Then the valleys and mountain-sides all around, covered with rich forest, are adorned with Rhododendron maximum, and Kalmia latifolia in immense abundance and profuse blossoming, of every hue from deep rose to white, and here and there, among other flowering shrubs, Azalea calendulacea, of every hue from light yellow to the deepest flame color. Mrs. Gray was with me, with her brother, two nieces, and a botanical party consisting of Messrs. Canby, Redfield, and Sargent. We traversed a pretty large and very wild region, much of which I had before visited, some thirty-eight years before. We went to the locality of Shortia galacifolia, discovered by Hyams; but our search for new stations, or for the old one of Michaux, was in vain. But I have now a clear idea of the district in which it may be sought. The known station is probably one to which the plant has been brought down.

I have returned home to a crowd of work. . . .

I wait with great interest your volume on Phytography. You will see that in my new "Text-Book" we are quite in accord. I agree with you about new and useless terms, and the execrable taste of the Germans.

I am very strong, and can climb a mountain as well as ever, only I lose breath except I move slowly in the ascent.

Memory rather fails; otherwise I have at near sixty-nine all my faculties in fair condition.

It has happened that I have visited Europe every eleven years. According to that you should see me next year! I cannot promise; but I am always affectionately yours, ASA GRAY.

TO R. W. CHURCH.

November 11, 1879.

I forgot to ask if you, or your friend Lord Blachford, knew Arthur James Balfour, M. P., author of "A Defense of Philosophic Doubt," published recently by Macmillan?

It is the most masterly essay I have seen of late years, and I should like to know who the man is, and what you think of his book.

I have been drawn into promising, in an unguarded moment, to give two lectures to the theological class of Yale College (our oldest university after Harvard) some time in the course of the winter, on Science and Religion; a topic which calls for wise speaking. I am not very hopeful, but still I have an idea I may do some good. I wish you were in reach, that we might talk over the subject. . . .

TO A. DE CANDOLLE.

CAMBRIDGE, January 1, 1880.

MY DEAR DE CANDOLLE, — Though I have entered on the seventieth year of my age, I hold out well, and when other cares do not interrupt, I go on with the "Compositæ," yet all too slowly. Before I print them I shall hope to have another inspection of some of the species of the "Prodromus" in your herbarium; perhaps before this year 1880 is out, yet it is rather doubtful. I get on slowly, and then Mr. Watson, who will have the "Flora of California" off his hands as soon as he can get the manuscript of the "Gramineæ" out of Professor Thurber's hands, must have a vacation ramble, probably to Oregon. If he leaves here in the spring, I must wait his return here in the autumn, or at most cannot leave home until after midsummer; too late to render myself at Geneva, I suppose.

Much of my time of the last few months has been occupied with the details of building a small addition to our herbarium building to contain the botanical library. It is just finished, and the books will now be moved into it in a few days. . . .

My health is excellent. Let us hope the same for you, and offer my best wishes for the year 1880.

Dr. Gray delivered in the winter of 1880 two lectures to the theological school of Yale College, on Natural Science and Religion.

They were long and carefully thought out, and he had great pleasure in speaking to an audience who followed him so closely, and evidently with such attentive sympathy.

He also enjoyed very much reading them, before delivery, to his friend Dr. O. W. Holmes, in Boston.

TO G. FREDERICK WRIGHT.

CAMBRIDGE, January 17, 1880.

DEAR FRIEND, — We go Monday night on to Washington, leaving here at five P. M. My lectures are fixed for February 5 and 6, so that I shall return from Washington and go on specially to New Haven.

I expect to be at home the last week of the month, but perhaps not on Monday, and I should wish to see you and read my second lecture, which is dragging its slow length along! . . .

CAMBRIDGE, March 11, 1880.

I have this moment received and read from Newman Smyth a flattering note, and a copy of his article in the "Advance." A very good one it is, and his own thoughts are noteworthy and to the point.

President Gilman of the Johns Hopkins sent me a very admiring letter, in which he urges a student's edition, on thinner paper and paper covers, which he wants to subscribe for. I shall send it to the publisher before long.

April 11, 1880.

I am amused at Professor ——'s substitution of demiurgism for evolution, reprinted in the "Independent," and at the coolness with which the professor proclaims that a hypothesis which he thinks is good for nothing else may be good to put against evolutionism.

Darwin has sent me advance sheets of his book on Advantage of Crosses (not moral but floral crosses, and not crosses made of flowers, but those made by insects and winds for the benefit of flowers), and I see much in it which you will enjoy. I am too full of work to use it next week, and if you tell me you will

come Monday and take it, I will lend it to you for that week.

Professor Fisher has sent me an admirable sermon on "The Folly of Atheism." Have you seen it?

. . . I would change a word in paragraph seven. If by proof you mean demonstration of its truth, I remark that rational explanation of the phenomena, so far as known, does not prove an hypothesis. Two different hypotheses may do that; and it may long be impossible to get a crucial test.

Sincerely yours, A. GRAY.

Dr. Gray was at work on another part of the "Synoptical Flora." Asters had always been his especial study, and a great and puzzling labor, and these few lines tell of his difficulties.

TO GEORGE ENGELMANN.

April 17, 1880.

We heard only incidentally of your accident, and were very sorry. Do be careful. Don't climb ladders. Leave that to young fellows like me! . . .

I am half dead with Aster. I got on very fairly till I got into the thick of the genus, among what I called Dumosi and Salicifolia. Here I work and work, but make no headway at all. I can't tell what are species and how to define any of them, nor what the nomenclature is, i. e., what are original names.

I will take this group abroad, but it will be just as bad there, unless I can get some settled ideas before I start. I never was so boggled.

To-morrow I 'll sit down and study your Pinus paper, which I have not looked at yet, so absorbed have I been. . . .

My old friend John Carey has died, in England, at eighty-three. Schimper, they say, is dead. They go one by one!

CAMBRIDGE, May 8.

First, thanks for your very lively letter of May 4, — auspicious day, being my wedding-day, thirty-second anniversary. . . .

Yes, we mean to go abroad right after the meeting of American Association, say September 4, to finish Aster, etc.; to stay at least a year.

My wife sends best love to you, your daughter, and son, and I join.

TO JOHN H. REDFIELD.

CAMBRIDGE, April 21, 1880.

DEAR REDFIELD, — If you hear of my breaking down utterly, and being sent to an asylum, you may lay it to Aster, which is a slow and fatal poison.

Apparently it will take a year or more for me to finish it, with the greater chance that it finishes me before that time. . . .

April 24.

Thanks for both specimen and sympathy. The former is here safely returned.

The A. glacialis I must seek in Nuttall's herbarium, now at the British Museum.

The principal troubles in Aster are packed away, to try on again, in London, Paris, and Berlin.

TO R. W. CHURCH.

CAMBRIDGE, May 17, 1880.

MY HONORED AND DEAR FRIEND, — Is it possible (I fear it is) that your letter to me at the beginning of the winter (telling me who Balfour, M. P., is)

has been all this while unacknowledged? I fear it is even so.

In the mean time much has happened, at least in your old world, on which interest centres; here not much, but constant and rather humdrum work for me. We have got through the winter, a mild one, in contrast to yours, so severe and trying, and our spring opens pleasantly; and Mrs. Gray and I are well and happy.

You have had a parliamentary election, the result of which we delight in, though it took us, and seemingly most of you, by surprise. I fancy you are pleased to see Gladstone again at the helm, and still more at the collapse of Jingoism, — not a moment too soon.

But let me hasten to tell you that Mrs. Gray and I contemplate crossing the Atlantic early in September, and of passing at least a full year in England and on the Continent. A busy year it must be, if my powers hold out; for I must do a deal of work, and I want to have a little play. I wish I could be more ready, by the finishing of my general study of the vast order Compositæ, so that I might know exactly what researches I must make in London, Paris, Berlin, etc. I have not got on as I expected; but, as I am to reach seventy if I live to near the end of the current year, I must no longer postpone my voyage. Indeed, I would leave at midsummer if I could get away. But the American Association for the Advancement of Science meets in Boston at the end of August, and has a day in Cambridge. And it would not do for me, an ex-president, to turn my back on it, and upon a houseful of friends whom we wish to entertain. But the moment it is over we shall hope to be off.

I think I must work at Aster, etc., at Kew for a few weeks; and I have a fancy for a run through the west and south of France and, perhaps, Spain!

You will be returning from some summer trip about the time we reach England. Cannot you and Mrs. Church get away from a dark and dull London November, and go with us to a summer region!

I sent you my Yale Lectures, which had to treat difficult and delicate matters. I find they have been useful to some on either side.

TO A. DE CANDOLLE.

CAMBRIDGE, June 8, 1880.

I have left your kind letter of March 11 too long unacknowledged. Now I have to thank you for a copy of the "Phytographie," which interests me exceedingly. I have also to say that my plans for the year are so far settled that I have engaged passage for Mrs. Gray and myself in a Cunard steamer from Boston for Liverpool on the 4th of September, the earliest date on which we could leave home.

But, greatly as you tempt me, and much as I should like to see you early, we cannot reach Switzerland this autumn. . . .

I should hope we might see you in early summer. So, pray, keep yourself well and strong till then.

About the "Phytographie:" I shall have much to write, when I read the book, which as yet I have only glanced at. About dextrorsum and sinistrorsum: I think it is not quite true that the innovators have not given any account of the grounds on which they rest. Mine are expressed, I believe, in two or three notes in "American Journal of Science," and are summed up in my "Botanical Text-Book," last edition, p. 516,

referred to in the glossary and index. I think that the analogy of the right-handed screw indicates how the world in general regard it, ab extra. There is a sensible note on the question in the late Clerk-Maxwell's "Treatise on Electricity," vol. 1, — the reference is not at hand at this moment. It takes, essentially, our (my) view as it seems to me; but it refers to a similar confusion between the mathematicians and the physicists.

I wish you had gone on to illustrate more of the words which have been changed or confused in meaning; for example, "pistillum," "cyme," etc.

It is a pity that the terms of nomenclature had not been rearranged by Roeper[1] so as to conflict less with those of Linnæus and the general botanical use.

We have had our centennial of the American Academy; a pleasant reunion. . . .

Mr. Winthrop gave a good public address.

I get only slowly on with the Compositæ; my interruptions and distractions are many and great. Fortunately I am in perfect health; am outliving my chronic catarrh. I hope you may do so also!

June 28, 1880.

Yours of the 15th is duly received, with your pleasant remarks on my lectures.[2] Professor Bourier is very welcome, and will please me by using any part of them he chooses. I should like to see how they would read in French.

[1] John A. C. Roeper, 1800–1884; director and professor in the Botanic Garden at Bâle; removed to Rostock, Prussia, as professor, before 1840.

[2] The Yale Lectures.

CHAPTER VIII.

FINAL JOURNEYS AND WORK.

1880–1888.

Dr. Gray sailed for Europe with Mrs. Gray early in September, 1880. He went especially to study herbaria for his new volume of the "Synoptical Flora," and saw almost every collection of importance, giving especial attention to the subject of asters. The autumn was spent in western France and Spain, and in Madrid he looked over the herbarium there. He declared nobody had ever had so many asters pass through his hands as he had had!

The winter was spent in hard work in the Kew herbarium. He enjoyed heartily in spring a journey through Italy with his friends Sir Joseph and Lady Hooker, returning to Kew to spend the summer, at work in the herbarium, and he sailed again for home in October, 1881, landing early in November.

TO JOHN H. REDFIELD.

Hôtel Continental, Paris, October 3, 1880.

My dear Redfield, — Many thanks for letter of 17th September, which reached me at Kew, where we passed a busy and happy fortnight with the Hookers, and did some botanical work. We left Friday morning, reached Paris pleasantly that evening, where we make only two days more stay at present, but leave

Tuesday for the Loire district and thence to Spain, but expect to return here after our round, and stay possibly a month. Play first, work afterwards, is our present motto. If the Academy, or any of the brethren, take Garber's little Porto Rico collection, you or they will be glad to know that Professor Oliver and I named them up while I was at Kew, and that the list has been forwarded to D. C. Eaton. News I have little to tell you. Yet, though we left home only a month ago, it seems a half year. We had a botanical concours at Kew; for De Candolle and wife came over, as he says, to see Mrs. Gray and me, and the Hookers gave two dinner parties on the occasion; present four botanists, whose united ages sum up high, for Bentham had his eightieth birthday just before, De Candolle is about seventy-five, I on the verge of seventy, and Hooker, the baby of the set, in his sixty-fourth year; some younger botanists were with us, — Oliver, Baker, Masters, young Balfour, etc.

TO J. D. HOOKER.

MALAGA, August 30, 1880.

. . . As to pictures, you know I am no picture sharp; but Madrid and Seville (which must be taken together) are a revelation of Murillo and Velasquez. . . . That kind of thing is nearly over with us on leaving attractive and sunny Seville. We cut off Jerez and Cordova, and came in here yesterday through olive groves enough to saponify and saladulate creation, and the passage through the mountains from Bobadilla to Malaga, wonderfully grand, ending in orange groves filling lovely dells and valleys.

Nothing to keep us long here, though picturesqueness is not wanting. The days are hot. At Granada, to which we fly to-morrow afternoon, we expect to find the *juste milieu*. . . .

One bit of this sheet to tell you that Joey's portrait has been painted by Murillo, and a good likeness, hair, pose, and features. He is holding a bird aloft, and a white little dog is looking up wistfully at it, to Joey's delight. It is in the Museum at Madrid, and is much admired. . . .

TO R. W. CHURCH.

THE ALHAMBRA, GRANADA, November 2, 1880.

It is time that you should be thanked for the notes you kindly sent us. They will come of use later. You will wish to know what we have been doing for the past month, only a month by the almanac, for we left England October 1, and Paris on the 6th, the latter being the date we count from. So that there is not yet quite a month of travel, yet it seems a long while, as if stored with a year's memories. And the weather throughout has been superb. One cold day in Paris, and some cool nights between Bordeaux and Madrid; and then, even at Madrid, we had summer rather than autumn weather, until, ascending from Malaga to this higher region, the cool and fresh air which comes down from the snow-flecked Sierra Nevada makes the sunshine pleasant and wraps desirable at nightfall.

A few midday hours served for Orleans, and we went on to Blois. You know how very charming that is, and you may imagine Mrs. Gray's delight at the

castle, also at Chambord, to which we drove. Two nights there and three at Tours. The cathedral charmed us; also the old houses and ruined bits and towers. We passed Amboise, and went from Tours to Chenonceaux and back by railway, — a bijou to be enjoyed; but the next day's excursion to Lôches had a much deeper and more varied interest. By traveling over night to Bayonne and passing Biarritz at sunrise, a noble sunrise and morning, with the Atlantic on one side and the Cantabrian Pyrenees on the other, we gained the privilege of a daylight journey from Irun to Burgos. It is far more picturesque and striking than I had supposed. A day at Burgos was a treat, as you may suppose. Leon lay out of our track and demanded night hours and night changes too severe and too formidable for a couple ignorant of Spanish and impatient of couriers. So we went on overnight to Madrid (night travel being inevitable); and here we had a warm, sunny, busy, and most enjoyable week, some pleasant home-friends for companions, as also a charming Spanish family, M. and Mme. Riaño, whom we had met at our minister's, Lowell, at London. She is a daughter of Gayangos and had an English mother; is a charming mixture of Spanish and English and everything that is bright and good. Then there was a raree-show not to be matched out of Spain: the royal family with the infanta going to church in state, the grand procession kindly going and returning under our windows. The Armeria and, still more, the Archeological Museum were full of the Old World things we Americans dote on. And then the great picture-gallery, supplemented not a little by the Academia San Fernando. Add to

these the pictures at Seville, and imagine the treat we have had. I shall leave all this for Mrs. Gray to expatiate upon next winter.

We now know Murillo, and rank him next to Titian, and in feeling and delicacy much above him. He could paint something besides Spanish-girl Madonnas, lovely as they are, and Spanish beggars, where he had only to copy from the streets; and whoever has not seen St. Elisabeth of Hungary, the Roman Senator and his Wife, the Guardian Angel, Moses striking the Rock, and its companion, the Loaves and Fishes, and the St. Antony of Padua, down to whom the Infant Christ lightly floats, encircled with child angels, has not yet seen the works of Murillo. Then Velasquez, most noble, and Zurbaran and Ribera, and Cano, Morales, and Moro, and others whom I never knew aught about before. At Toledo we passed two days and three nights, well filled with sights of Old World things hardly touched by the later ages; and there is the grandest of cathedrals; and yet the interior of that of Seville is rather more satisfying. These three, Burgos, Toledo, Seville, I should place in this ascending order, or bracketing the latter two.

A journey overnight brought us at sunrise into Andalusia, at Cordova, which we passed (to take on the way from Granada), and so to Seville for breakfast, three happy, sunny, busy days there, and then to Malaga, two days, and then on to this place, which we reached after dark, and are now enjoying our second day in.

There are two hotels up here, under the Alhambra walls, and we are at one of them. Yesterday the road

which rises to the crown of the hill was crowded with people of the town below, going up to the cemetery with flowers and lamps and candles and drapery, to ornament the tombs and graves of relatives, which here is done on All Saints' Day, and we saw the curious sight by day and walked up again in the evening, when all was alight, and in a chapel a sort of requiem service performing. We will not describe the Alhambra. I fancied I should think the work finical; but you are carried away by it. But of most interest was our visit to the Cathedral of Granada this morning and to the Capilla Real, to see all the relics and contemporary memorials of Ferdinand and Isabella, their effigies, sword, sceptre, etc., their noble tombs, more rich and beautiful, I think, than those of the Constable and his wife at Burgos, and then to descend into the vault and see their rude iron coffins, which have not been desecrated nor molested, and also those of Philip I. and his poor wife Joanna. (Let us tell you, some day, of a modern Spanish picture, at Madrid, of her and her husband's coffin, which she wearily had carried with her.) All this, and what we see here on the spot of the Moorish life, and what we saw at the cathedral, gives a vivid reality that nothing else can.

And here my sheet is full and my gossip must be cut short, with short space to add the kindest remembrances and love which my wife joins in sending to you and yours and daughters.

TO J. D. HOOKER.

HÔTEL ST. ROMAIN, PARIS, November 14, 1880.

Here we are back at Paris (since twenty hours), and, this being Sunday, having discharged my religious duty and ventilated my patriotism by going in the morning to the American Chapel I am going to discharge upon you a missive which may be of some size, — is sure to be so if I open all my mind. Whence did I write you last? Malaga, I fancy, where I received a letter from you . . . which tells us of the conflagration of Charlie's dog and cat, and the narrow escape of the owner, of horrid weather, while we have had only one rainy day, and that no great impediment (though I did have to examine the Botanic Garden at Valencia under an umbrella and in india-rubbers). . . .

A good day was occupied in going to Cordova, and the next morning did the Mosque-Cathedral, which I expected to be disappointing, yet it was not. Afternoon began the long journey which there was no escaping, northeast to Valencia: a dull place made duller by rain. Next afternoon to Tarragona, and a most charming day in that interesting old town and its environs, the evening taking us on to Barcelona, of less interest. The next day's travel, long and delightful, was all by daylight, except the last hour. It took us along either beautiful or picturesque country, much of the way with the Mediterranean on one side and the Pyrenees on the other, out of Spain and as far as Narbonne. A day's excursion was given to Carcassonne; perfect, and stranded on the shore of time, an excellent example of a Middle Age fortified city, cathedral and all; Visigoth walls and towers on

Roman foundations, extended and modernized by the father of St. Louis, and the finishing touches by St. Louis himself.

Here endeth the epistle. The rest is simply getting back to Paris. I had counted on returning by way of Nîmes, Clermont-Ferrand, and a little détour to see the cathedral of Bourges. But the winds from the mountains made Narbonne and Carcassonne cold, the few trains from Nîmes were unseasonable, my wife declared she had so many cathedrals mixed up in her head that she could not endure another, and so, leaving Narbonne in early morning, we reached Cette ten minutes after the express train for Paris had left, and we came on in omnibus train in unbroken journey, through Montpellier, Nîmes, and Avignon (which we had visited, in former years), and via Lyons to Paris. And here we are.

Two months of play, delicious play, are up: we landed two months ago to-morrow. We have had our share, and I have now an appetite for work. I can be usefully busy in Paris for a fortnight, hardly longer. Then what? Much depends on what you can see your way to. The traditional "three courses" seem to be before us, each with its advantages and disadvantages; and we are so balanced that we shall be likely to incline as you push the scale. . . .

Course 3. Bear the English winter, if we can't avoid it, on the principle that "what can't be cured must be endured." And with your good fires and snugness it is not so bad. Secure our lodgings, and we will come over to you about the first of the coming month; and I get a solid piece of work done.

If I can utilize the long evenings nothing can be

better. Then in March or early April, when England is apt to be raw and rough, but Italy is smiling, we will rush to meet the spring, and return to England when that, too, is delightful and its days long and sunny. Note also, that even an Italian winter may be chilly and damp, and when it is so, there is no seeing galleries and churches without teeth-chattering and cold-taking, and it is not easy to get warm lodgings and decent fires. This course 3 would suit me best of all; for then we, lingering longer than you might be able to take time for, should return to England via Vienna and Berlin, which Mrs. Gray has never seen, and in the latter I have Willdenow's herbarium to potter over.

Now, my dear old friend, perpend my words (if you can read them; I write on an awkward bit of table), and then have your say.

HÔTEL ST. ROMAIN, November 21, 1880.

The correspondence of late has naturally been conducted by our respective better halves. I have at length (after giving Cosson two or three days to name up his American and Mexican plants) got fairly at work at the Jardin des Plantes, and have found (mainly in the herbarium Jussieu) the originals of several of Lamarck's asters, which gives me happiness. They take every pains to accommodate and assist one at the herbarium. I see old Decaisne at his house; he is not strong.

I think we shall need two weeks more here, and we hope for better weather than we have yet had. Colds one always takes at Paris, and Mrs. Gray now has her share. It took a long while to be clear of the

one presented to me on our arrival here in October. But in the south of Spain my throat was as clear as a whistle. We are not bad just now, and are hopeful.

I was perfectly sincere in writing that I should prefer returning to Kew for two or three months and to reserve Italy for the early spring. I shall get more work out of it so. At the same time I was confident that it would suit you best, and I am glad that you jump at it. It may enable us to get off the fag end (and best part) of Hayden's report, if ever he sends over the portion in type. I am surprised that it has not before this come to hand.

TO MISS A. A. GRAY.

HÔTEL ST. ROMAIN, PARIS, December 3, 1880.

MY DEAR A., — I cannot tell you how much I was touched by your letter of the 18th of November, following the round-robin, the letter of Mrs. J. and that of Charley. And what could have possessed my brothers and sisters, and nieces, and "their cousins and your aunts" to club together a contribution on the occasion, as if nobody in the family had ever got to have a seventieth birthday, or ever expected to! Well, it was indeed truly good and thoughtful of you all, and it gratified me beyond measure. As you were the organ of the family, upon the occasion, let me ask you to be the medium for conveying to one and all my acknowledgments and most hearty thanks for their words and deeds and kind thoughts of me at this interesting time.

And now what I am to do with the presents that

have poured in, that is, what am I to present to myself in your name, and keep as a souvenir, — that is the question which is exercising my mind. It must be something personal to myself, and I am not much given to personal adornment, and have few personal wants beyond daily food and clothing, of which I always say that "the old is better." But I have got an idea, — which I will not put on paper yet, because I may change my mind and not carry it out. You shall see in time.

"Aunt J." and I are having a nice time here in Paris, in spite of the short and dark days. But we have been very, very busy, each in our way, and now and then busy in company, as we have been to-day. And then at evening we come back to our little room, and have the nicest little dinner together in the little *salle-à-manger* of our little nice hotel; or rarely we go out, but never to fare better; and we have been invited to three dinner parties, each notable and enjoyable in its way. And now I have to-morrow one more day of botanical work, and then we expect to go back on Monday to Kew, and to the lodgings which we occupied a dozen years ago. You can write to your aunty directly there: Mrs. Shepherd's, "Charlton House," Kew. Don't suppose that because it has a name, the house is a grand one. Not a bit of it. But in England, houses, like babies, have names given them when they are little.

Good-by. With dear love to all, along with thanks, I am Your affectionate

ASA GRAY.

TO MESSRS. REDFIELD AND CANBY.

Kew, December 12, 1880.

My dear Brethren, Redfield and Canby, — I think I had a letter from each of you, and that you had some response from me of some sort (and one or two papers, etc., have come from Redfield), but that was so far back in memory when we were staying in Kew before, that it seems to belong to that early phase in my existence when I was living on the other side of the ocean; and that seems as widely distant in time as the ocean is wide in space! It is only by the almanac that we know that we left Cambridge less than three and a half months ago.

I have not done very much for botany in all that time; but Mrs. Gray and I have laid in a stock of health and vigor, corporeally, and have filled our heads with such interesting memories! This and such constant changes of scene have produced the illusion I refer to, through which, as through a haze, I dimly discern last summer. But out of that haze your bright and kindly faces look undimmed.

Did I tell you (I think I did) of the pleasant fortnight here in September, when guests at Hooker's; when for botany I worked up Oxytropis; when De Candolle and wife were here, and Bentham — serene old man — dined with us almost every day; of our crossing one bright day to Paris, and all that? . . . Thence, abandoning, from lateness of the season, the plan of returning through Auvergne, we came on quick via Nîmes, Lyons, etc., to Paris.

There Mrs. Gray and I passed three very busy and very charming weeks; also doing some good botanical work, and having a good time with Decaisne and the

other botanists at the garden, with Dr. Cosson and M. Lavallée.[1] Then, as the Hookers could not carry out their promise of joining us and going together to Italy now, we agreed to defer that till early spring, and back we came here for work. We are settled in our old lodgings on Kew Green, where we feel quite at home, and are near the Hookers and the herbarium; and here I am to polish off the Asteroideæ, — some very rough surfaces in Aster yet to grind down. We should be pleased to hear from you.

It was at Cordova that I spelled out in Spanish the welcome news that the Republicans had carried the election, and grandly.

And now, with Mrs. Gray's love joined to mine to your good wives and children, I am

Cordially yours, ASA GRAY.

Dr. Gray settled down at Kew for hard work, but as the days were very short, and of course the herbarium was closed at dusk, he had long evenings. There were many pleasant dinners, among others at Mr. John Ball's, where he met Robert Browning; and a charming visit to Lord Ducie at Tortworth, where he was much interested in the fine and rare trees, and had an afternoon's visit to see Berkeley Castle, one of the oldest, if not the oldest, of inhabited castles in England. He paid another interesting visit to Cambridge, to Professor Babington, where he had not been since his visit in 1851, and where among others he met again Dr. Thompson, then Master of Trinity, who had

[1] Alphonse Lavallée, 1835–1884. Paris. "His specialty, ornamental trees and shrubs, of which he had nearly the largest and best collection in Europe, studying them with assiduity" [A. G.].

so kindly received him in 1851. Mr. Lowell was then minister to England, and there were pleasant meetings with him.

In early March he crossed to Paris, where he was joined by Sir Joseph and Lady Hooker for a journey by Mt. Cenis to Italy, going as far south as Castellamare and to Amalfi and Pæstum, and returning; short stays in Rome, Florence, and so to Venice, where the party divided, Dr. Gray going to Geneva.

TO A. DE CANDOLLE.

KEW, December 26, 1880.

. . . I am making slow progress with the Asters. The original types of all the older species I shall certainly make out; but the limitation of the species presents great, if not insuperable difficulties.

I have read nearly all of Darwin's "Power of Movement in Plants." It is a veritable research, with the details all recorded; and so it is dull reading. I think it will give the impression to most readers that the terms "geotropism," "epinasty," "hyponasty," etc., contain more of explanation than in fact they do. Yet now and then a remark should prevent this, as on page 569, and notably on page 545, at the close of the chapter, intimating, — I suppose with reason — that the term "gravity" or "gravitation" is quite misapplied.

I have just taken up Wallace's "Island Life," and find the earlier chapters most clear and excellent, but without novelty. The idea of the persistence of continents is most commonplace in America since Dana's address in (I think) 1845, and I should have thought

Wallace would have known of the entire prevalence of that view, at least in the western world.

Rely on me, dear De Candolle, to keep you *au courant* with all that concerns your friends here, among which always remember your devoted,

ASA GRAY.

TO GEORGE ENGELMANN.

KEW, February 19, 1881.

MY DEAR ENGELMANN, — A few days, or say a week ago, we were gratified by receiving your pleasant letter of the 31st January. I hasten to reply before we get afloat again, when writing becomes precarious. Just now Mrs. Gray and I have our evenings together in our quiet lodgings, that is, whenever we are not dining out or the like, which is pretty often.

You know of our movements, then, up to our return here. The Spanish trip was very pleasant and successful, and the three weeks afterward in Paris both useful and enjoyable. As to botany, it was all given to Aster and Solidago, at the Jardin des Plantes, and at Cosson's, who has the herbarium of Schultz,[1] Bip., which abounds with pickings from many an herbarium.

We got over here early in December, and here I have worked almost every week day till now, excepting one short visit down to Gloucestershire, and a recent trip to Cambridge, where, however, a good piece of three mornings was devoted to Lindley's asters. I know the types now of all the older species of North

[1] Dr. C. H. Schultz [Bipontinus], 1805–1867. Rhenish Bavaria. A distinguished botanist, who devoted himself to Compositæ, and amassed an extremely rich herbarium in that family.

American aster, Linnæan, Lamarckian, Altonian, Willdenovian,[1] — excepting one of Lamarck's, which I could not trace in the old materials at Paris; and Röper writes me that it is not in herbarium Lamarck. As to Nees's asters, most of them are plenty, as named by him directly or indirectly. But where, on the dispersion of his herbarium, the Compositæ went to nobody seems to know, though I have tried hard to find out. Have you any idea? But he made horrid work with the asters, and the Gardens all along, from the very first, have made confusion worse confounded. No cultivated specimen, of the older or the present time, is *per se* of any authority whatever. I am deeply mortified to tell you that, with some little exception, all my botanical work for autumn and winter has been given to Aster (after five or six months at home), and they are not done yet! Never was there so rascally a genus! I know at length what the types of the old species are. But how to settle limits of species, I think I never shall know. There are no characters to go by in the group of Vulgar Asters; the other groups go very well. I give to them one more day; not so much to make up my mind how to treat a set or two, as how to lay them aside, with some memoranda, to try at again on getting home, before beginning to print. The group now left to puzzle me is of Western Pacific Rocky Mountain species. The specimens you have collected for me last summer, when I get them, may help me; or may reduce me to blank despair!

[1] Willdenow's Asters were sent over to me here! — A. G.

TO A. DE CANDOLLE.

VENICE, May 1, 1881, Sunday.

As we propose to leave Venice to-morrow, I think I may say that within ten days you may look to see us in Geneva. The Hookers, with whom we have journeyed thus far, will proceed more directly home, after a day or two at the Italian lakes. We propose to follow more leisurely, and, if the road is fairly practicable, to cross the Simplon, and so to Geneva, where, according to your suggestion, we will go to the Hôtel des Bergues. . . .

We have now been two months in travel, without respite, and for my part I am fairly sated. I need the change and rest which a week of botanical research in your herbarium, and of intercourse with its owner, will afford me.

We have been as far south as Amalfi and Pæstum. We have attended to the proper sight-seeing of Naples, Rome, Florence, and Venice, and have gained novelty by seeing also Orvieto, Cortona, and Siena, likewise Ravenna. We have escaped a disagreeable spring in England, but at the expense of being everywhere at least a fortnight too early for the various parts of Italy; and I suppose we shall be all the more sensible of this at the lakes and in crossing the Alps. But the weather has never been unfavorable, and we have enjoyed much and worked hard. A week near you in comparative rest will make an agreeable finale. Our companions have added much to the enjoyment, and we are sorry to part with them. They would, I know, send their best regards and remembrances, but at this moment they are both out; but Mrs. Gray, who is writing by my side, desires me to add her own to

Madame De Candolle and yourself; and I am always most sincerely yours, ASA GRAY.

TO J. D. HOOKER.

LUGANO, May 8, 1881.

. . . Mrs. Gray was able to see little of Padua, beyond the Giotto frescoes and a look into San Antonio, the interior of which looked richer than ever. I kept moving; took a turn in the pleasant old Botanic Garden; found Saccardo;[1] saw two plants of Amorphophallus Rivieri in blossom; was taken up, by Saccardo's aid, by Dr. Penzig[2] of Breslau, a gentlemanly young fellow, and of good promise, who took me in hand at the garden, university, etc.

HÔTEL ST. ROMAIN, PARIS, May 22, 1881.

If I write you a letter this evening, having nothing else to do till bedtime, mind, you, who have everything to do, are not bound to do more than to read it. Mrs. Gray and Lady Hooker seem to manage correspondence very well, and we may take it easy. But I want to tell you what a pleasant and restful week we had at Geneva. The De Candolles were delightful. He comes in from Vallon every day at ten, and stays till half past four, and I passed much of the time in the herbarium, where I had various old dropped stitches to take up, which I happily accomplished. As to sociabilities, De Candolle had made a dinner party for the very day we arrived (Friday), which I had barely time to get to. I met there Edouard

[1] Pietro Andrea Saccardo; professor at Padua.

[2] Otto Penzig, M. D.; formerly assistant professor at Padua, now professor at Genoa.

Naville and his wife, the latter new to me, and a Pourtalès, cousin of our Count Pourtalès, who died last summer, and who, as a young man, followed Agassiz to the United States, and was a very important man to Alexander Agassiz. His death was severely felt by all of us. Naville, who is a capital Egyptologist, we knew in Egypt twelve years ago, where he was exploring Edfou and monographing one of its acres of wall sculpture and hieroglyphics, and we met him at De Candolle's the next summer. We went out last week to his place at Marigny, on the north side of the lake, charmingly placed, with a full-length view of Mont Blanc in front; the lake in the foreground.

Casimir and wife are in England; Lucien off at some baths for rheumatics. But Lucien's wife was at De Candolle's, and is a pleasant lady. On Sunday De Candolle sent in his coupé, and took Mrs. Gray and me to dinner en famille at Vallon, — only Madame Lucien and some grandchildren. Vallon is a very pretty place and the house charming. Madame De Candolle is lively, even sprightly in her own house, and, I may as well tell you, is greatly in love with Lady Hooker. We were sent home in the coupé in great style; as also we were on Friday evening last, when De Candolle gave us, for parting, a small dinner party, — Professors Wartmann and Saussure, and the banker Lombard, — Plantamour, the astronomer, being detained by the stars; his wife came, however. All these Genevese speak English well, except Madame De Candolle, who gets off a little, and what with this and their pleasant ways, we were quite at home with them.

Boissier had written to us to come down to Valeyres, but he had expected us earlier. As he was to be off in less than a week, and Mrs. Gray well used up, on reaching Geneva, we declined, and begged him to come to Geneva, which he did on Monday, and stayed well into Tuesday. He took me to his herbarium, which is large and well kept, and I looked up some old things of Lagasca's, which I could find no trace of at Madrid. Barbey I regretted not to see. He goes with his father-in-law to the Balearic Isles, — goes, indeed, because he is concerned for Boissier's health, and well he may be.

Argovian Müller I saw something of; busy and happy in the care of the garden, the Delessert herbarium, and the professorship in the new university, built up with the late Duke of Brunswick's money. The death of his only son was a great blow to him; but he seems cheerful and is very busy. De Candolle is working over Cultivated Plants and their origin. . . .

I see I must go home this autumn, and, indeed, that seems best on almost all accounts. So I should be at Kew soon, and once there I must set myself to work most diligently, and make the most of what time remains.

I hear nothing as yet of Bentham. I hope he is going on well, and the Gramineæ nearly finished, and that he will next take up Liliaceæ. . . .

AIX LA CHAPELLE, June 8, 1881.

. . . Then we took train on the road down the Moselle (which we had followed from Metz). From Trèves halfway down to Coblentz the country had a

decidedly American river look; that is, it constantly reminded one of the Mohawk or the Unadilla, — small rivers of my native State and district, and with just such rounded wooded hills and smooth, well cultivated slopes, and wide stretches of meadow and grain fields. Then came the picturesque portion with precipitous hillsides and crags covered with vines wherever a bit of soil could be found to hold them, extending down to Coblentz. We went on by the railroad down the left bank of the Rhine to Cologne, which we reached late in the afternoon and left at three this P. M.; reached this place at half past four; and while Mrs. Gray rested, I have explored till our half past six dinner hour. Trèves was an interesting place, though it need not detain one long. Cologne we were glad to see again, and were as much interested in its old Romanesque churches as in its cathedral,[1] which certainly is much bettered by the completion of the nave and the west front and towers, — I may say towers and spires, — for they make nearly all the west front. It does not compare with Reims, so far as façade goes. . . .

On reaching Paris in June Dr. Gray met again his old friend Decaisne and many others, and there was much pleasant hospitality at the hands of friends new and old. He especially enjoyed a day at Verrières, seeing, in the old home of M. and Mme. de Vilmorin, the dear friends of thirty years before, the oldest son Henri with his wife and children, the grandchildren of M. and Mme. V. of the corresponding ages and number as the family of young people whom he met in the first visit in 1851.

[1] Seen first in 1850, with its temporary roof and bases of towers.

On returning to Kew, though the time until leaving late in October was busy with steady work, there were pleasant breaks with visits and excursions. He had the pleasure of meeting Dean Stanley, first at the christening of a daughter of Professor Flower's, and was to have dined with him, but the dinner was postponed on account of a slight indisposition of the Dean, which developed into his fatal illness.

There were many pleasant visits and excursions, some delightful stays in Devonshire and Somersetshire, when pleasant acquaintances were renewed. He spent a few days again at Down with Mr. Darwin, and in August he went to York for the meeting of the British Association. He stayed with Mr. Backhouse, the well-known horticulturist, and saw his wonderful underground caves of ferns, and his successful alpine garden, and enjoyed the social as well as the scientific meetings.

At Kew he was surrounded with friends, renewing the close intimacy with his old and lifelong friend Sir Joseph Hooker; was near his friends at the Deanery at St. Paul's and at Broom House; and he rested now and then with a day's sight-seeing. The days passed all too quickly until the time came for breaking up for the return to America. There was a short stay at Oxford, with Sir Henry Acland, most interesting days, and again at Manchester at Professor and Mrs. Williamson's hospitable home, and then the voyage to America, when he landed early in November.

TO MESSRS. CANBY AND REDFIELD.

KEW, July 15, 1881.

MY DEAR OLD FRIENDS, CANBY AND REDFIELD, — How very long it is since you have heard, at least directly, from your Old World wanderers! How long and from whence, is more than I can tell. I use now an enforced half hour before an engagement, and when it is, would you believe it for England? too hot to go across the Green to use the half hour at the herbarium, where I have sweltered all the morning, regular Philadelphia heat, and this is the third day of this the second heated term.

I wrote you from Italy, I think.

. . . It is hopeless now to try to give any narration of our doings. The flavor would have all evaporated in the attempt to recall and review the past spring.

I think you know our routes, from Paris in March to Turin, to Genoa, Pisa, Rome, Naples, and the country around, Amalfi and Pæstum our most southern points; then Rome again and a twelve days' stay, then a run to Orvieto and Cortona on the route to Florence, a visit to Siena from Florence, a detour from Bologna to Ravenna, most old-world of towns, thence to Venice, a week only. And as we left it, the Hookers, whose furlough was running out, dropped us at Padua, whence, passing Verona, where we had been before, we had a day at Brescia, thence to Milan, Como and up the lake, and over to Lugano, and back to Milan. Thence to Arona at foot of Lake Maggiore, and a drive all the way up to Domo d' Ossola, and then diligence over the Simplon pass and through the snow, and down to Brieg, and on to Martigny to sleep, and then on to Geneva, where we passed a

delicious week, with De Candolle and other friends to enjoy, and a little botany to attend to in the herbarium. And then in one day we went to Paris, and stayed three weeks, while Mrs. Gray did her feminine matters, and I a deal of botany work, and both a little sight-seeing. Thence, sending our luggage before to London, we swung off for Soissons and the old castle of Coucy, and Reims, and Trèves, and down the Moselle to Coblentz, and the Rhine (that is, by rail) to Cologne, to enjoy the finished cathedral; thence to Aix la Chapelle, to Bruxelles, and then, with a fine day and smooth water, over to England; and here at Kew we have been settled ever since, engaging in a deal of botanical work and a deal of society in a most agreeable way, and a little (thus far only a little) sight-seeing. As we come towards the end, we grow busier every day, and count the time closer. For we expect to return in October, to reach home (*Deo favente*) either at the end of that month or before the middle of November; the day and vessel not yet quite fixed. . . .

There are lots of things to write about, but the sheet is full, and I must only say I am

Yours affectionately, ASA GRAY.

TO R. W. CHURCH.

RICHMOND HOUSE, KEW.

. . . It is really serious, this leaving England, and choice friends in it, when one considers that, whatever I may fondly say, I cannot expect to see it again, — I do not say *them*.

Affectionately yours, ASA GRAY.

CAMBRIDGE, MASS., November 14, 1881.

MY DEAR FRIEND, — Dr. Holmes is a good soul, and has just sent me the inclosed for the autograph which I promised H. I wish she, and especially that M., could be here now, to enjoy our exquisite dry and stimulating air, which, with American oysters, should set her up completely.

I have missed Freeman. He had gout and some other engagements, which took him from Boston the day before we landed. My critical friends at Cambridge say that his lectures were disappointing. They say he took no pains in preparation, or at least fell into the common habit of your countrymen when they come here, that is, of giving lectures and water. The Bostonians prefer, and appreciate, something more concentrated and higher proof.

I do hope you will promise Mr. Lowell a course of lectures, few or more, next October.

The foundation of the Lowell lectures requires that courses shall be delivered, as often as possible, on subjects pertaining to Christianity, natural religion, etc., which may come as near to sermons as you like. Pray do not decline the invitation offhand. You would have a most appreciative audience. You see we are counting upon you, with two daughters at least, for the next summer and autumn. In haste, to save the post,

Affectionately yours, ASA GRAY.

TO GEORGE ENGELMANN.

CAMBRIDGE, December 13, 1881.

MY DEAR OLD FRIEND, — It is shabby of me to wait so long in response to your kindly greetings, which were dated on my birthday, November 18.

But I was very busy when it came, and hardly less so since, and so I let it get out of sight.

Well, here we are once more, leaving dear friends on the other side, and now among our own kith and kin.

Glad to hear of your pleasant summer, and pretty good health now.

We had a favorable voyage home, which is more than those just before could say, and far more than any since. . . .

Nees's asters, of his own herbarium, I can nowhere find or hear of. But I don't believe his herbarium (which was sold piecemeal) would have helped me much, considering how he has named asters for other herbaria. . . .

Accumulated collections, of Lemmon, Parish,[1] Cusick,[2] etc., especially have taken all my time up to now, after getting my home in order, a deal of trouble. And now I can think of getting at my "Flora" work again.

First of all, I am to make complete as I can my manuscript for Solidago and Aster. Solidago I always find rather hopeful. Aster, as to the *Asteres genuini*, is my utter despair! Still I can work my way through except for the Rocky Mountain Pacific species.

I will try them once more, though I see not how to limit species, and to describe specimens is endless and hopeless. So send on your things. But first I am to print, *pari passu* with my final elaboration, an article, "Studies in Solidago and Aster," — taking the former first, giving an account of what I have

[1] Samuel B. Parish, San Bernardino, Cal.

[2] William Cusick, Crowell, Oregon.

made out in the old herbaria, stating investigations which I can only give the condensed result of in the "Flora," etc. Considerable change as to some old species.

When I have done the Solidago, then Aster in that way. . . .

TO A. DE CANDOLLE.

CAMBRIDGE, December 29, 1881.

I am doubtful if I have written to you since our return, and my New Year greetings will reach you somewhat late, but are very hearty. I could hardly have neglected to send you word of the satisfaction with which we look upon the fine bust of your father, which stands at one end of our herbarium; Robert Brown and William J. Hooker at the other, and your lithographic portrait overhead is replaced by the more striking photograph you gave us.

At length we are settled in our home; have had for the twenty-fifth time the annual Christmas family gathering, for which my study, being the largest room in the house, is always upturned and emptied, and I should be quietly at work upon the Compositæ, were it not for an attack of lumbago, that uncomfortable attendant of old age, which just now interferes with my activity, without actually laying me up. . . . We, Mr. Watson and I, are still much occupied with the distribution, and therefore in good part the study, of the recent collections which have accumulated here and are still coming in. Much valuable time do they consume. The most interesting are from Arizona, etc., near the Mexican frontier, among which those we have most to do with are by Lemmon and by Pringle.[1]

[1] C. G. Pringle; for many years has explored the botany of Mexico.

The former, I know, — and I shall soon know as to the latter, — has sets to dispose of, and I think you would like to have them. We formerly have taken a deal of trouble in assisting such collectors in the disposal of their plants offered for sale, but we are obliged now to leave aside such affairs, as they consume too much time.

I have no other botanical news for you. Dr. Engelmann, who of late has roamed a good deal, is now at home, and busy with botanical work, of various sorts, Isoetes, Cupressus, etc. It is quite probable that he will cross the ocean again next spring, in which case you will probably see him. Professor Sargent is busy with his forest reports in connection with the United States Census of 1880. Mr. Watson in this service made a long journey through our northwest region, while I was in Europe, at too late a season for much ordinary botany; and he has been otherwise too busy since his return even to look over his collections.

My colleague, Professor Goodale, giving over to Professor Farlow the university lectures, etc., is now abroad with his whole family, to recruit health and acquire information. You will see him at Geneva in spring or summer, and I commend him to you as a dear friend and a very valuable man. My wife joins me in kind remembrances and best New Year wishes to Madame De Candolle and yourself, and I am always your devoted ASA GRAY.

TO J. D. HOOKER.

CAMBRIDGE, December 25, 1881.

. . . I am kept indoors this pleasant Christmas Sunday, which is here as fine and bright a day as was

the Christmas of last year, which we passed with you, and which comes up fresh to our memories. . . .

I have just cleared off the portion of accessions to herbarium which had accumulated here and which I had myself to see to, and am settling down to my Compositous work. And now I am taking an oath that when I do get about them I will hold on to the bitter end, that is, I suppose till I reach the Wormwoods. And now I must go to Washington on the 18th prox. for meeting of Smithsonian regents. . . .

Sargent has got his arboretum at length on to the hands of the city of Boston to make the roads for, to repair and to light and police. He seems to have made a mark in his Census forestry work. He has developed not only a power of doing work, but of getting work done for him by other people, and so can accomplish something.

January 27, 1882.

. . . My whole soul is in the "Flora of North America," but the new things that come in, owing to opening of Arizona and other railways, and which have to be seen to, keep Watson and myself so busy. So our movement is like marking time four days to going ahead one. . . .

Engelmann promises to make us a visit in the spring. How I shall make him work! No other news just now.

TO SIR EDWARD FRY.

CAMBRIDGE, February 26, 1882.

MY DEAR SIR EDWARD, — It is high time that I thanked you for a very pleasant letter which at the beginning of the year you kindly wrote me from

Failand House, a place which is very green in our memories. It reached us at Washington, where, with Mrs. Gray as my inseparable companion, I went to attend the annual meeting of the regents of the Smithsonian Institution. We were away from home little more than a week, and even in that time we managed to bring in a little visit to friends in Philadelphia.

This miserable trial of Guiteau, of which you already knew unpleasant particulars, was still in progress; but I did not go near the court-room, and could not readily have been induced to do so. The day after I received your letter I met an acquaintance, one of the judges of the Court of Claims (a court for trying claims against the United States government preferred by citizens or others, and much is it to be wished that a mass of claims presented to Congress and cumbering its committees could be passed over to this court), and I drew him into conversation upon the scandal which the trial was causing. He spoke of Judge Cox as a man of ability and high character, referred to the impossibility of shutting the prisoner's mouth, the expectation that the man's prolonged revelation of himself before the jury would throw more light upon the case than any amount of expert testimony, which I think was expected to be more contradictory than it actually was, and of the determination to leave no ground for the ordering of a new trial. My friend told me he had been twice in the court-room, thought the judge might and should have exercised more control, yet that what he saw and heard did not appear to him at the time so indecorous and offensive as it appeared when presented in the newspapers. Indeed, this sensational newspaper reporting is a huge nuisance, and in respect to these matters our

highest-class daily papers are little better than the lowest. I suppose the telegraph reporting for the press is all done by one set of men, and the more sensational the reports the more welcome to the papers, which, with few exceptions, print without any selection or discrimination.

I have settled down to my work with enjoyment, but with a growing sense of discouragement growing out of an *embarras de richesses*. It was natural to find here a great accumulation of collections of North American plants, all needing examination; but unfortunately, they continue to come in faster than I can study and dispose of them. This comes from the increasing number of botanical explorers, and the new facilities offered to them by new railroads along our southwestern frontiers and other out-of-the-way regions. The consequence is, that while new and interesting things are pouring in, which one must attend to, and which are very enjoyable, I do not get ahead with the steady and formidable work of the "North American Flora." I begin to think it were a happier lot to have the comparatively completed botany of an old country to study, in which your work "were done when 't were done," and in which, even if it were not done quickly, you were not called on to do it over and over, to bring the new into shape and symmetry with the old.

By the way, I finally wrote out an article on a question which you once treated, and upon which we more than once conversed, taking for my text a paragraph in Lubbock's address at York last summer. I had partly promised Mr. Walter Browne to write it, so I sent it to him; and as a proof from the "Contemporary Review" has come back to me, I suppose it may

be printed before long.[1] I shall be curious to know what you think of it.

I sent you a portion of a New York religious newspaper containing a sort of review of two books with which I beguiled the voyage last October or November. It is of no great consequence. But I sometimes write such reviews or articles to papers of this kind, which are endeavoring to do their best in bridging over the gap between the thoughts of a former generation, or of our younger days, and of the present day. I believe such articles are now and then helpful.

You supposed that I had seen the "Lyell's Life and Letters" sooner than I had. To my surprise the volumes are not reprinted in America; and I have only just succeeded in procuring a copy from England.

I have read a good deal of it, and with much interest. The allusion to me, which you referred to, was of course very pleasant. The last chapter of the "Antiquity of Man" had apprised me (for I never had any direct correspondence with Lyell) that we thought much alike on such matters; and we are apt to approve views which agree with our own. I always thought Lyell a very level-headed man, — one with a very judicial turn of mind; and his letters and journal bring this out well, as they do the whole life and the charming character of the man. It is interesting to see how early he took the line which he followed in his whole life's work, and which has changed the face of geology and philosophical natural history. For, indeed, Lyell is as much the father of the new mode of thought which now prevails as is Darwin. I have said a word about this, which I will try to send you.

That is a noble letter to Mr. Spedding, about the

[1] *Contemporary Review*, xli.

American war. We knew that was in him. During the time of trouble, our then minister in London, Mr. Adams, and Mrs. Adams used to say that Sir Charles and Lady Lyell were almost their only, and their very stanch and efficient supporters.

If you happen to know who the author of "The New Analogy," by Cellarius, is, I beg you will let me know. Although as a whole it may not amount to much, there are some capital hits in it.

I have been writing you a monstrously long letter. I have only space to ask you to give my kind remembrances to Lady Fry and the young people, of all whom we have such happy memories.

TO A. DE CANDOLLE.

March 16, 1882.

. . . Your letter of the 25th of February tells me of the will of dear Decaisne, whom we shall miss greatly. The main disadvantage of our years is in these losses, which to us are never made up. He was a very true friend. . . .

I am glad you will make a supplement to the "Lois." When you have it in hand I wish you would communicate to me, in letter, your main points on the critical questions. You, Bentham, and I are most in accord; and we ought to agree, essentially. Upon any critical points, I had much rather make my comments, for whatever they may be worth, before you print than afterwards. I have kept phænogamous botany essentially orthodox in the United States. . . .

May 15.

. . . It is now all but a year since Mrs. Gray and I had that charming week at Geneva!

Much has happened since then. We have lost dear old Decaisne; and now Darwin! We hardly should have thought, twenty-five years ago, that he would have made such an impression upon the great world, as well as on the scientific world!

I do not know if you ever saw much of him. He was a very charming man.

Here we have lost, at a good age, both Longfellow and Emerson.

I have been anxious about Bentham, from whom there were discouraging accounts; but his last letters are hopeful, and he is steadily at work. Let me hope, and let me know, that you are quite well; also Madame De Candolle.

TO J. D. HOOKER.

CAMBRIDGE, September 17, 1882.

. . . At Montreal we were guests of Dawson, who wanted to return some hospitality we had afforded him and his daughter. . . . Dawson has toiled for a lifetime at Montreal, under many discouragements, has accomplished a deal, and deserves great credit.

. . . We had a pleasant time, and this fortnight in Canada was my only vacation. I went to visit the grave of Pursh, who died at forty-six. They have put his bones in their pretty cemetery, and put a neat stone over them. . . .

Glad you are to send me scraps of one or more species of Dyer. It should have been a tinctorial genus. . . .

TO R. W. CHURCH.

October 8, 1882.

It is probable that I have not responded by a line to your letter of April 13, yet I think my wife has

written more than once to the Deanery, and we have had good accounts of the visit to Italy, which appears to have been a great enjoyment to all of you. And now we have the news of H.'s engagement, which must give you a novel sensation. How time flies and events develop! It seems but a little while since she and her sisters were little girls at Whatley. And now, when this reaches you, a year will have gone round since we said goodby in London.

I have not much to say nor to show for this year. Though I have never worked more steadily, and never with so much concentration, there seems to be little to show for it. At times I am disheartened, but a hope as irrepressible as I suppose it is unreasonable and extravagant bears me up and on. There is, indeed, a good pile of manuscript to show, but I will not begin printing until I have gone through with the vast order of Compositæ. That may be at Christmas, — I may say I expect it, — but I never yet came up to any such expectation. To give you some idea of what my task is, I hope to send you soon a copy of an exhortation which I read to the botanists at the recent meeting of our American Association for Advancement of Science at Montreal (in the Queen's dominions!) This journey to Canada was my only holiday this past summer; though Mrs. Gray got as much more, with her brothers and sisters at Beverly, on the coast; a bit of country and of country life we are longing to have you see.

The gathering at Montreal was most pleasant, and we were happily placed as the guests of the president of the year, Dr. Dawson, principal of McGill College, at which the sessions were held. Among the foreign savants, we had . . . Rev. and also M. D. Professor

Haughton, of Trinity College, Dublin, a man of very varied knowledge, . . . a somewhat rollicking companion, which, however, did not hinder his preaching a goodly and serious sermon in the Cathedral on Sunday; I believe rather eminent in mathematics, and who has done a good piece of physico-physiological work on muscular power. But what took me by surprise was his intense, truly Irish hatred of England, and of Gladstone in particular. Probably he did not like the disestablishment of the Irish church.

And as to Ireland, — what a year you have had, and only dim hopes that the next will be better; I do hope Gladstone will hold on and hold out. The Egyptian affair, as it turns out, must strengthen his administration not a little. Ever since we were in Egypt, I have been longing to have England take the control of that country, as the only hope of the fellahs and Copts, — the only people there for whom one has any sympathy.

I was to write you about the great brimming St. Lawrence, and of our trip down it to the Saguenay. But Mrs. Gray will be writing all that, and also giving my hearty good wishes to H., dear soul. But I have not left room even to say how sincerely I remain,

Yours affectionately and truly, ASA GRAY.

December 11.

You ought to have heard from me before this, but you have probably got information indirectly of my little mishap, which may account for not writing with my own hand. Not a quite sufficient excuse; for at much inconvenience I managed very soon to do some writing, in awkward fashion, as well as to turn over specimens; otherwise I should have been unhappy.

Well, hard upon six weeks ago, I managed to break the top of my right shoulder-blade. It was done by a bit of carelessness, not to say foolhardiness, by continuing to do at seventy-two what I have done in former years, relying too much on my quickness and sureness of foot in stepping off a horse-car (*anglice*, tram) when in motion. In the darkness I supposed it had slowed up, which in fact it had not, and so a bad fall. Well, the bone is thought to be well mended, and I use the arm for certain purposes almost as well as ever, but cannot yet get my clothes on and off without assistance. My wife, as you will believe, has been a capital nurse, and she credits me with a most unexpected amount of patience. . . .

But if you don't come soon I shall despair of you. And Gladstone, I know, will be tempting you; but I doubt if you will budge, except he would place you in more sunny quarters than the Deanery, — a place which corporeally I know is not at all good for you, nor for Mrs. Church.

I read that you have preached a sermon in commemoration of Dr. Pusey, at Oxford, which I hope you will print, and I count on receiving a copy. I prize very much a copy of a discourse by Dr. Pusey, given me through Acland when we were there a year and a quarter ago, addressed to me in a very flattering way.

By the telegraph we learn you are having a very severe snowstorm, attended with suffering. We are now having our sixth of this winter; but we do not mind it.

I rejoice with you at Gladstone's success. He and Dufferin have earned laurels. Let us hope he will hold out several years yet, and continue at the helm. But how cordially he is hated!

Here we get on, prosper, indeed, quite without wisdom, or with very little of it. One of these days we shall need it. There are things I should like to write about. But my arm is not up to continued use.

Mrs. Gray will send messages *propria manu*. So, with my kindest regards to Mrs. Church and all your happy family, I am affectionately,

Yours, ASA GRAY.

TO SIR EDWARD FRY.

BEVERLY FARMS, December 1, 1882.

We were very sorry to read in the telegraphic news a few days ago of the destruction of Clevedon Court by fire, a most sad and unexpected thing, but we hope not so bad as the brief announcement portends. It brought back to our memory the delightful afternoon which Mrs. Gray and I passed there a year and some months ago. A modern house can be replaced, but not an old hall like this. It makes us sad to think of it. Perhaps you can tell us that the loss was exaggerated in the telegraphic account.

I am writing from the house of Mrs. Gray's brother, on the seashore, where we are passing the "Thanksgiving" holiday. "Thanksgiving Day" is a Puritan institution, was formerly confined to New England and the districts settled by New Englanders, and has been kept from the time of the landing of the Pilgrims at Plymouth, and is annually appointed by the governors of these States by proclamation. But within the last fifteen or twenty years it has become national, and the day, the fourth or the last Thursday in November, is announced by a proclamation by the President. In New England it long took the place of Christmas, for which you know the Puritans had

no liking, and was the chief family gathering-day as well as a day of religious service, or at least of political sermonizing. But Christmas is completely restored even in New England, though the other holiday is not dropped.

The north shore of Massachusetts Bay is very pretty, the shore backed with woods and rocks, and sheltered against the northeast bleak winds; and the situation where we are is one of the choicest. It is near the mouth of Salem Bay, Salem at the head, three or four miles above, and the hills beyond close the view at the west; the peninsula of Marblehead lies opposite on the south, dividing this water from that of Boston Bay; southeast the sea-line is broken only by three or four low islands. When my good father-in-law bought the land here, then waste wood and sheep-pasture, forty years and more ago, it was two or three hours from Boston. Now a railway brings it within an hour, and now the whole coast down to Cape Ann is occupied with what you would call villa residences, the grounds of all the most desirable ones reaching to the water, partly with rocky shores wooded with pine-trees and junipers, partly with sandy beaches, good for bathing-grounds. This place combines the two, and is well wooded at the back, and commands the most beautiful views. Most of the houses are used only for summer residences; but this is occupied the year round. I have never been here in the winter before. Winter we are here in the midst of already, unusually early, and the ground is white with snow, of which there is usually little before Christmas. But our winter differs from yours in its sunshine, the brilliancy and cheer of which is a good offset for the colder weather, or at least the lower thermometer.

A good number of our English acquaintances have been over this autumn. Dr. and Mrs. Carpenter are among the last to return. He has just closed a popular course of Lowell lectures, and they go back a week or two hence. One hardly knows what brought Herbert Spencer. He seems most to have enjoyed Niagara, where he stayed a week. I do not think the dinner demonstration for him at New York amounted to very much; nor do I take stock in the statement, the truth of which he took for granted, that the hair turns gray in the United States ten years earlier than in England. I should say the only difference is, that there is more hair remaining here to turn gray at middle age or later. Spencer also told us of a discovery he had made, that all Americans had the outer corners of their eyes lower than the inner, the opposite of our antipodes, the Mongols.

I have just returned from a "sleigh ride." Snow, though a nuisance in towns, is a convenience in the country, greatly facilitating travel, and a drive upon runners instead of wheels, well wrapped in furs and with buffalo robes, is much enjoyed.

At the end of August, Mrs. Gray and I went to Montreal, to the meeting of the American Association for the Advancement of Science, where we were guests of the president, Dr. Dawson. We made an excursion to Ottawa, the new seat of government, and another down the noble St. Lawrence and up its picturesque tributary, the Saguenay. Otherwise we have been at home all the summer and autumn. And so we expect to be all winter, save perhaps a week in Washington.

. . . I think I have long owed your son Portsmouth a letter, but, though I should be glad to hear

from him, and to know how he is getting on at Oxford, I cannot pay my debt to him to-day. And some twinges tell me that it is time to spare you.

I will just add that what we hear prepares us to expect that before this reaches you, or even leaves this country, we may hear that the good and wise Archbishop of Canterbury will have gone to his rest; and Gladstone will have a most responsible as well as the most dignified position to fill.

TO GEORGE BENTHAM.

CAMBRIDGE, December 17, 1882.

I must not let the New Year come to you without repairing my delay in the way of letter-writing, and sending you greeting and good wishes for the season. Especially I may congratulate you, and felicitate ourselves, that is, we botanists, that you have, or will have, brought your *opus magnum* to a completion! — proof-reading excepted. A great thing to have done. I did not make reply to your last of October 14, because I really could say nothing about the Eriocauloneæ. . . .

Yes, I have De Candolle on Cultivated Plants, and am well pleased with it, so far as I have looked it over.

Thanks for your complimentary mention of my notice of Darwin. I have since sent you another brochure, an exhortation to my botanical compatriots to have more consideration for my time, considering how little is left, and what a deal of use I have for it. I can hope only to palliate the evil a little.

Your life has been a most enviable one, in being able so to arrange and control your time, and with your indomitable industry, perseverance, and judgment,

you have turned your opportunities to full account, winning no end of gratitude and admiration. Now, do take the relaxation and repose which you have so completely earned; and take, as you may, great satisfaction and pride in all you have accomplished. At least your many friends will do so. . . .

I did hope to have got to the end of the Compositæ with the end of 1882; bnt I shall hardly do more than finish the Helenioideæ. As I go on, I study all Mexican border things, at least these of our North American collectors.

My health is excellent; so I may fairly hope to get the North American Compositæ off my hands and in print, barring accidents, and I shall be careful of my bones, and other contingencies. . . .

TO J. D. HOOKER.

May 1, 1883.

. . . I have not read Carlyle's Life, by Froude, but many articles, in which of course the points are mostly given. All seem to agree that Froude has blackened the memory of Carlyle irrecoverably, or rather with rude hand wiped off the whitewash which covered the blackness. He was a rude, unkempt soul. From the extracts I have seen, I fancy that Mrs. Carlyle's letters beat Carlyle's all out for raciness and pith.

I am content with the Romane correspondence as R. leaves it, and pleased with Romane's tone, which I will try to tell him.

I think his first reply was a "beating of the air." And for that reason I returned to the charge. His second is to the purpose. And he seems to feel that mine was to the purpose also.

. . . As to dear Bentham, his life is the very ideal of a naturalist's life, and I have always regarded it one of the happiest possible and one of the most successful. . . . His administration of the Linnæan, his series of addresses, etc., will be looked back to as an oasis in the desert.

Our spring is late; the winter, or rather the drought of the previous autumn, has been deadly on perennials, herbs and shrubs. . . .

TO R. W. CHURCH.

May 22, 1883.

. . . I wish to condole with you over a hardship which you write of, that of having to write a book on Lord Bacon. I quite understand that you should bemoan your fate at being drawn into that undertaking. I cannot think it at all to your liking. Bacon, of all people, if the best is to be made of him, I fancy, should be written of by a worldly-wise, if not a worldly-minded man. Moreover, I must confess to a heretical opinion as to another side of Bacon, that in which English, and all English-speaking, people glory. To blab it out: I have an ugly notion that he was rather a sciologist than a man of science, and that he really did nothing of real consequence for the furtherance of science; nothing to be compared with Galileo, a real father of "inductive philosophy" and scientific investigation — and Pascal. By the way, taking the two men all round, do you not think a taking parallel could be run with Bacon and Pascal?

Now, to change the subject, — what a noble old man Gladstone is, and what a great name he is going to leave as a high-minded statesman! I could envy you, if it were in my way, the privilege of his friendship.

H. was so good as to write me a charming letter from her new home, for which please give her my thanks.

By the way, if you see our observatory director, Pickering, you will find him an unaffected man, wise in science above his years.

TO J. D. HOOKER.

CAMBRIDGE, September 3, 1883.

MY DEAR HOOKER, — A letter of yours of July 24 has been on my table a good while, and now to-day comes yours of August 22. So I am to write you at once, urged thereto mainly by your quandary about subspecies, varieties, and how to manage them in a popular flora like the British, in which forms need to be distinguished more than in outlandish floras.

I have a decided opinion as to the form of treatment, and from your letter, as well as I can gather, I coincide with Ball. At least, I would not have subspecies. They are, as the saying goes, "neither flesh, fowl, nor good red herring."

Some you would accept as species; make of the rest varieties, with names.

In characterizing species having marked varieties, should the specific character comprehend the forms or varieties, and then there be a "var. a" or type, or "typical form?"

I thought over this when I began my "Synoptical Flora," and concluded that it was best to characterize the species on its genuine representatives only. Of course as far as practicable, and indeed for all but some special points, the characters will, and should, cover the whole. And at the end of the character, you have only to add, the type of the species has so and

so ; then the variety or varieties with the special differentia.

From pretty large practice I find this works best, and probably your experience will have brought you to the same conclusion. . . .

"Liberavi animum meum," and it may go for what you find it worth. . . . I did not know that "Americans," i. e., good Americans, did say, "so and so intermarried with so and so." I see Ravenel, a Carolinian, says so.

TO GEORGE BENTHAM.

CAMBRIDGE, September 25, 1883.

MY DEAR BENTHAM, — I am so glad to receive a letter giving so comfortable an account of yourself; glad also that you would like to hear from me; glad to announce that, though there are still some genera to revise, I can tell you that I am about to begin the printing of the "Synoptical Flora," containing Caprifoliaceæ – Compositæ, — which when done, I shall feel something of the relief you must have had when the "Genera" was off your hands. That done, I look, with only that mitigated confidence that becomes an old man, for a bit of holiday, such as is always reinvigorating to Mrs. Gray and myself. I am so sorry you had to take up with a sick-room instead. But as you are now picking up finely, could you not be made comfortable and get rid of an English November and December by revisiting the scenes of your youth in the south of France? . . .

I think I sent you Trumbull's[1] (mostly) and my

[1] J. Hammond Trumbull, of Hartford, Conn.; a great authority on Indian languages and customs, and author of many contributions, historical and philological. Perhaps the only American scholar able to read Eliot's Bible.

annotations on De Candolle's "L'Origine des Plantes Cultivées." If not, let me know, for you have leisure to read now.

I am busy with an article on De Candolle's "Nouvelles Remarques sur la Nomenclature." As it may be my last say on the subject, I am going to make a rather elaborate article on nomenclatural and phytographical points, mostly small points, some of which I should have liked to confer with you about. I would have done so, but I feared, in the reported state of your health, to trouble you.

There are two or three small points, about name-citation and name-making, upon which I shall venture to criticise the "Genera Plantarum." But in almost everything we are in full accord, as you know, and I wish to impress the accordance upon the younger botanists of the United States. Nowadays, more than formerly, they get hold of many books, German and other — books, many of them, better for substance than for form; and so our botanists need guidance and some show of authority.

Engelmann has come home, looking far better than we expected, or than he thought to be; is visiting Sargent, and will soon come to us. . . .

TO SIR EDWARD FRY.

November 10, 1883.

In a line which I remember adding to Mrs. Gray's last letter to Lady Fry I expressed a hope and confident expectation that we should have done with General Butler as governor of Massachusetts. The election occurred last Tuesday; an extraordinarily large vote was cast: Butler was defeated by 10,000, and an excellent man, a member of Congress from the

central part of the State, a lawyer, who makes considerable sacrifice in taking the governorship, is chosen in his place, and there is a majority of two thirds in both branches of the legislature to support him. We hope that this makes an end of Butler's power for harm, or at least cripples it. He is a desperate demagogue. . . .

I doubt if either of the friends you mentioned came to Cambridge at all. My friend Agassiz had the pleasure of meeting them at Newport, and was greatly taken with them. . . .

I am beginning to print the Compositæ for my "Flora of North America;" and am revising for the last time some of the more difficult and more unsatisfactory portions. My wife now excuses me to her friends for outbreaks of ill-humor, the excuse being that I am at present "in the valley of the shadow of the Asters." This is "sic itur ad astra," with a vengeance. If only I can have done with the printer by the close of the winter months, with any life left in me, then we will go in for a holiday.

I am very well, and Mrs. Gray passably so. We have seen just a little of Matthew Arnold, with wife and daughter; shall probably see more of them.

TO R. W. CHURCH.

November 12, 1883.

. . . I have just seen the first proof of the portion of "Flora of North America" that I have been moiling over for so long; and over them and the ever-renewed touches to the ever-growing Compositæ, I may expect a toilsome winter. That done, I hope about the time that the clear and biting, but rather enjoyable, winter subsides into the inclemencies of our early

spring, we hope, if we live and thrive, to take a holiday. Just how and where is not yet clear, but I hope to have something to say of it before I am done with this letter. Meanwhile I am curious to know if you have disposed of Bacon. If your essay pleases me as much as your remarks in your letter to me, I shall enjoy it. I recant all I wrote you long ago, begging you would drop him and take up a more congenial subject. . . .

I am just back this evening from hearing Matthew Arnold read some of his poems to a great hallful of undergraduates and others, in place of a lecture which he was to give, but, poor man! was prevented by his agent, who seems to be rather his master. He was well received; but one cannot say that he is a very graceful or a good reader to an audience of eight hundred or a thousand people.

He tells me you offered him an introduction to me, which he thought he hardly needed, as we had met him and Mrs. Arnold at a lunch given by Miss North. We are sorry to hear of the determining reason of his visit and lecturing tour. . . . He will succeed in this, no doubt; but it is a sort of dog's life, this lecturing all over the country, four times a week, at the beck of an agent, who controls all his movements, often to audiences that will not appreciate him, the more as what he tells me is true, that he has no gift as a speaker. But he is pleasant, and will be most kindly received.

Your Lord Chief Justice was most kindly cared for and made a most pleasant impression. But in Boston, besides coming when every one was away who should have attended to him, he fell, unwisely, into the hands of . . . Governor Butler, and saw a side of

American life and manners which may be well enough for him to see, though we should desire the contrary, and will add to his rich repertory of stories, which they say he can tell so well. The day he was shown over our university he called here, and took a cup of tea with us. He had recently been visiting our good friend Lord Justice Fry at Failand, and spoke of Lord Blachford as his friend and neighbor. . . .

March 31, 1884.

. . . I have, moreover, another reason for sending you this line, to thank you for the proof-sheets of the "Bacon." I read it at a sitting, one day when I was too ill for my daily task. I enjoyed the book greatly, all the more, probably, from my freshness, not having read anything upon the subject that I now recall since Macaulay's essay, ages ago. It is like reading a tragedy.

What a great failure Bacon was, whenever he was tried! Poor Essex, hunted to death merely for "getting up a row," and Bacon sacrificing him without compunction, and without seeing that he was probably made a tool of, merely to serve his personal advantage! Then the poetical justice, as they call it, — very prosaic justice, — of his own destruction, by a bolt out of a clear sky, which an enemy was adroit enough to direct to his ruin. And poor Bacon with conscience enough to feel that he deserved it, but not spirit enough to make a fight. No, if Pope's fling was undeserved, as you say, it was because of the mean and ignoble set around him.

Almost as pitiable and tragic in its way, pitiable in its true sense, was the upshot of Bacon's higher and nobler life, conceiving vaguely and laboring all his

days over that which he was unable and incompetent to bring to the birth. His memory reaping a great reward of fame for a century or so, and then the conclusion reluctantly reached that nothing tangible in the advancement of Natural Science can be attributed to him. Altogether, what a solemn sermon! It might be preached from the pulpit of St. Paul's.

Well, I seem to have attempted sermonizing myself, and it is time I stopped.

We join in the thanksgivings you are devoutly rendering,[1] and I am always,

Yours affectionately, ASA GRAY.

As this is the last letter from Dr. Gray to Dean Church, to be printed, the occasion is taken to introduce a letter written by Dean Church to Mrs. Gray some time after the death of his friend, when acknowledging the receipt of a copy of the "Scientific Papers."

DEAN CHURCH TO MRS. GRAY.

I have to thank you for two volumes of most interesting reading. Besides the interest of the subject discussed, there is a special *cachet* in all Dr. Gray's papers, great and small, which is his own, and which seems to me to distinguish him from even his more famous contemporaries. There is the scientific spirit in it, but firm, imaginative, fearless, cautious, with large horizons, and very attentive and careful to objections and qualifications; and there is besides, what is so often wanting in scientific writing, the human spirit, always remembering that, besides facts and laws, however wonderful or minute, there are souls

[1] The birth of the Dean's first grandchild.

and characters over against them, of as great account as they, in whose mirrors they are reflected, whom they excite and delight, and without whose interest they would be blanks. This combination comes out in his great generalizations, in the bold and yet considerate way in which he deals with Darwin's ideas, and in the notices of so many of his scientific friends, whom we feel that he was interested in as men, and not only as scientific inquirers. The sweetness and charity, which we remember so well in living converse, is always on the lookout for some pleasant feature in the people of whom he writes, and to give kindliness and equity to his judgment.

And what a life of labors it was! I am perfectly aghast at the amount of grinding work of which these papers are the indirect evidence. . . .

For they [his religious views] were a most characteristic part of the man, and the seriousness and earnest conviction with which he let them be known had, I am convinced, a most wholesome effect on the development of the great scientific theory in which he was so much interested. It took off a great deal of the theological edge, which was its danger, both to those who upheld and those who opposed it. I am sure things would have gone more crossly and unreasonably, if his combination of fearless religion and clearness of mind, and wise love of truth, had not told on the controversy.

TO J. D. HOOKER.

CAMBRIDGE, June 9, 1884.

Your last is of May 24th from the Camp, and gives us on the whole better accounts of your invalids. Bentham at Boultibrooke! I wonder if he would care

to have letters from me, or from Mrs. Gray, to whom he wrote a treasure of a note on the New Year. We had an idea it might only worry him. . . .

I wish we could see you at the Camp and among the heather, and I wish I could form a clear conception of just how you are placed, taking the Rotherys' house as a point of departure.

We give you up as to America this year. I would not have you and Lady Hooker just run over here for a call; it would be too provoking. Well, let us plan for January or February next, and Mexico, Arizona, and southern California.

"Man never is, but always to be blest."

The Joad herbarium was a real bonanza. . . .

I must tell of our two weeks' run, Mrs. Gray and I. We left the too tardy spring here, one evening; were the next noon in Washington, where the spring was in full force and beauty. After two days, left Washington one morning, followed up the Potomac River to its very rise in the Alleghanies, and down on to Mississippi waters before dark; woke near Cincinnati, had a pleasant day's journey to St. Louis, which we reached before sunset. There had five days, rather busy ones; thence a journey of thirty-six hours, over prairies of Illinois and Indiana to Buffalo, and to New York city; there two days, and then home.[1] Mrs. Gray, thus away from household cares and a rough air, dropped her cough altogether; and what you would think a tiresome piece of journeying brought us both home much refreshed. . . .

You remember Henry Shaw, his park and Missouri botanic garden. The old fellow is now eighty-

[1] Dr. Gray went to New York to finish his sittings to St. Gaudens for the bronze bas-relief now in the herbarium at Cambridge.

four. Something induced him to ask my advice, and to let me know the very ample fortune with which he is to endow the garden, when he dies. I was in doubt whether all this was likely to be quite wasted, or was in condition to be turned to good account for botany and horticulture when Mr. Shaw leaves it and his trust comes to be executed. I wished also to see that dear old Engelmann's herbarium should be properly and permanently preserved. So I went on to St. Louis. Mr. Shaw took me into his counsel and, without going here into details, without seeing a chance for doing much while Mr. Shaw lives, which cannot be very long, I see there is a grand opportunity coming, and I think that none of the provisions he has made will hinder the right development of the Mississippian Kew, which will hardly be "Kew in a corner." And if he follows my advice and mends some matters, there will be a grand foundation laid.

We are expecting Ball toward the end of the month. He will have time to travel and botanize before the Montreal meeting. But I can't go with him, nor, perhaps, could I much help him. . . .

Dr. Gray's friend of many years, George Engelmann, M. D., died in February, 1884. He was a student at Heidelberg with Schimper and Alexander Braun in 1827, and again in Paris, in 1832, with Agassiz and Braun. He came to America in 1834, made some journeys on horseback in the West, and settled as a physician in St. Louis, then a frontier trading-post, in 1835. He lived to see it become a metropolis of over four hundred thousand inhabitants. Dr. Gray says in his memoirs of him, "In the consideration of Dr. Engelmann's botanical work

it should be remembered that his life was that of an eminent and trusted physician; . . . that he devoted only the residual hours, which most men use for rest or recreation, to scientific pursuits. . . . Nothing escaped his attention; he drew with facility; and he methodically secured his observations by notes and sketches. The lasting impression which he has made upon North American botany is due to his habit of studying his subjects in their systematic relations, and devoting himself to a particular genus of plants until he had elucidated it as completely as lay within his power. In this way all his work was made to tell effectively. . . . It shows how much may be done for science in a busy physician's horæ subsecivæ, and in his occasional vacations. Personally he was one of the most affable and kindly of men, and was as much beloved as respected by those who knew him."

TO SIR EDWARD FRY.

October 10, 1884.

It is quite time that I responded to your kind and welcome letters. First, let me congratulate myself upon having you as a colleague in the Royal Society, in which I think you need not owe your fellowship to official dignity. I believe you took honors in science at the university, along with our friend Professor Flower.

You mentioned your approaching visit, with Lady Fry, to Lord Coleridge. . . . Lord C., referring to your visit, sent us very cordial messages in a letter to my colleague Professor Thayer. He will know that his host in Boston, General Butler, is one of the candidates for the Presidency.

I am, as you may suppose, a bolter from the

Republican presidential nomination. We even hope to give the electoral vote of Massachusetts, stanchest of Republican States, to the Democratic candidate. But I need not bore you with American politics.

Let me say how sorry we were not to see Miss Fox at our home. It might have been, except for a little journey we made from Philadelphia, of which I must tell you more.

I had a mere glimpse of Miss Fox at Montreal, and a little more of her cousin. She came late to Philadelphia, where Mrs. Gray (who was not at Montreal) and I had a most pleasant chat with her at a garden reception. The next day I went out to the suburban place where she was visiting, and came near to winning her for our expedition, at least as far as to Luray cave, and the Natural Bridge in the Valley of Virginia. But the engagements she had made could not be reconciled. Her hostess was to take her to this neighborhood, but too early for us to receive her here. All good people in this country think so much of Caroline Fox that they wished to know her sister.

I have not seen the book by Mr. Arthur on difference between physical and moral laws, and am not sure that I ever heard of it or of the author. Who is the publisher? I might find it at the university library. No, I never had the fortune to see, much less to know Maurice. Of course I have always known a good deal about him and of the remarkable influence he exerted, both in person and in his writings, "in which were some things hard to understand," such as his liking for the Athanasian creed, but nothing that was not most excellent in spirit.

Of course I well remember Miss Wedgewood; and we had occasional correspondence up to the time when

Darwin died, and she, on the part of the family, announced it to me. I am glad to know that she wrote the sketch of Maurice in the "British Quarterly."

And now about ourselves. I got the Compositæ off my mind late in the spring, but not off my hands until sometime in August. At the end of August and of the pleasant part of the summer here (for it was delightful in Cambridge, so cool and quiet, and Mrs. Gray away only for three weeks with her friends on the coast) I went to the meeting of the British Association at Montreal; enjoyed it much; read a paper,[1] a sort of address, to the botanists coming over to North America, which the Section seemed to like and voted to print in extenso. (I will first print it here, and send you a copy. Not that there is much novelty in it, but it may be readable.) I had to leave the meeting after three or four days, and return here; sorry to leave our friend Mr. Walter Browne ill at the hospital with typhoid fever. He and his poor wife received every kind attention, but he died in a few days.

It is agreed that the British meeting was a distinguished success. It brought over a throng of English people, and the American savants (I cannot abide the word "scientists") were in good force. We were repaid by the large attendance of British Association members at Philadelphia, where they contributed to make our meeting large and notable.

Up to this time the weather was all that could be wished, cooler, I suppose, than in England at the time. But that week at Philadelphia was raging. Mrs. Gray and I were there for the whole week, domiciled

[1] "Characteristics of the North American Flora," *American Journal of Science*, ser. 3, vol. xxviii. p. 323; also in *Scientific Papers of A. Gray*, selected by C. S. Sargent.

with friends in the heart of the city, — a city which never cools at night, as it does hereabouts. I bore the heat well, as my manner is; Mrs. Gray, fairly, by keeping quiet through the mornings and giving herself rather to the evening receptions, which were fine and most admirably managed. It grew cooler the moment the week was over and the session ended. Besides, we moved at once into a cooler region. It was arranged that I should lead any British botanists that cared to go on an excursion into the mountains of Virginia and Carolina. But they were otherways bound, so that I could take only my friend Mr. John Ball of London, your fellow F. R. S., taking also another American botanist, with whom we had visited these regions more than once before, and, to make it pleasanter, we added three ladies, wives and daughters of botanists, Mrs. Gray being one.

Our first day's journey was to Luray, in the Valley of Virginia, between the Blue Ridge and the proper Alleghanies. The next day we visited the Cavern, which I think is the finest in the world, not forgetting that of Adelsberg in Styria. It is newly discovered, with wonderful wealth and beauty of stalactical formations, and is lighted up for visitors with electrical lights in all the larger chambers. That day we went on to the Natural Bridge, which we had not seen for many years. It was grander than I had remembered; indeed, it and the scenery around is worth a voyage and a journey to see. Then we went on to our favorite Roan Mountain, on the borders of North Carolina and Tennessee, one of the highest in the Atlantic United States, and the finest; the base and sides richly wooded with large deciduous forest trees in unusual variety even for this country, the ample grassy

top (of several square miles) fringed with dark firs and spruces, and the open part adorned with thousands of clumps of Rhododendron Catawbiense, which when there last before, late in June, we saw all loaded with blossoms, while the sides were glorious with three species of Azalea, not to speak of many other botanical treasures. There, at top and at base, we passed four busy days. A narrow-gauge railway recently built, and new to us, reaches to the base of the mountain, up the Doe River, through most picturesque scenery, showing to most advantage in the descent. On our way back we diverged to visit some striking rock scenery on the upper Kanawha River, and thence to a mountain-top lower than Roan, but with the advantage of a charming little lake, with banks all fringed with Rhododendron maximum and Kalmia, hanging over the water for a rod or two, except on the side where the little hotel stands. Well, I have written a deal here, little as I have managed to tell you. I think you and Lady Fry should come over and see for yourselves, just a pleasant summer vacation, if you can leave Failand for so long.

TO J. D. HOOKER.

September 26, 1884.

So dear Bentham has gone, — not quite filled out his eighty-fourth year. Well, we could have wished this year of infirmity and suffering had been avoided. One would like to say good-evening promptly at the close of the working-day. But this we cannot order, so we must accept what comes. We shall miss him greatly. We have nobody left to look up to. He seems to have made a wise and good disposition of his effects.

Your two letters reached us at Philadelphia, on our return from North Carolina and Virginia. . . .

Yesterday we had Sir William and Lady Thomson.[1] To-day Traill and wife (young and bright) of Aberdeen looked in and lunched.

I come home to a heap of letters and parcels and affairs, to keep me busy awhile. . . .

Well, the meeting at Montreal was a success, and made a pleasant occasion. The influx of visitors from British Association to Philadelphia made that meeting very good too. George Darwin I just saw for a moment at Montreal, and Mrs. Darwin also at Philadelphia, one evening, — handsome and winning.

I hope you have got the copy of "Synoptical Flora II." for your own shelf, through Wesley. Slips and omissions are already revealing, especially in the index.

I am wonderfully strong and well. Mrs. G. well up to average, both much set up by holiday, of which mine has now lasted a month. . . .

What a deal you have fished out of Bentham's earlier life! I thought you meant Toulouse, not Tours. Bentham used to speak of Toulouse and that part of France. . . .

Among the inventive feats of his father was one I have somewhere heard or read of, that he made a fleet of articulated transport boats for descending the crooked channels of the Russian rivers.

I think you might have specified De Morgan's discovery of Bentham's contribution to logic, and his able defense of the reclamation, to which Herbert Spencer's "Verdict" in 1873 was not particularly

[1] Sir William Thomson, Lord Kelvin, — the distinguished physicist.

needed for the establishment of the fact. De Morgan was not a man to leave his work half done, especially as against Hamilton.

I only regret that the length to which these most interesting matters extended stood in the way of your giving a more detailed account of Bentham's botanical work, on which another article would be timely.

I must now, before long, attempt something of this, for the American Academy's éloge. And I pray you, if you are not doing it yourself, to send me hints and suggestions. Sheet full, and I will not begin another to-day, but add only my wife's love to you and Lady Hooker.

January 9, 1885.

The souvenir of dear Bentham has come to hand, is in its place on my table, and the first use I make of it, now in position, is to write to you this letter of thanks, — to you for awarding it to me, and to dear Lady Hooker for so promptly forwarding it. The stand is a beautiful piece of marble, bearing its two inkstands.[1] Was there ever anything to occupy the sunken area between them? . . .

Of myself I have not much to write. The prospect of getting off for the latter part of winter has just prevented my settling down to the "Flora," and I have found plenty else to keep me actively employed, mainly with a revision of some boraginaceous genera, now in printer's hands, which I hope, while it unsettles old work, will settle it better and permanently, as far as anything we do can be said to be lasting.

[1] The inkstand is now placed in the library of the herbarium with Sir William J. Hooker's hand-glass, so much used by Dr. Gray.

I am well, — can hardly be said to need the holiday we have determined on. . . . We shall benefit much, I think probable, by getting off to meet the spring, avoiding February-April here, which are the only drawbacks to a climate of the best: for you know I do not at all dislike summer heat.

We have not troubled ourselves much as to where we would go. But now it does seem that we will go to the southern part of California, if possible by the southern Arizona route, which is near the Mexican boundary, and must be best for winter, and to return by the route through the northern part of Arizona, which should be pleasant in the latter part of April. Oh, that you and Lady Hooker could be with us. . . . And we shall be lonely without you on our travels, and feel that "that great principle of the survival of the fittest" has been woefully violated. . . .

CITY OF MEXICO, Sunday, February 22, 1885.

Your letter of January 20, forwarded from Cambridge, overtook us at San Antonio, Bexar. We left home February 3, in bitter cold, for St. Louis, where I had an interview with old Shaw, and heard him read his rearranged will, which is satisfactory, as it will allow his trustees, and the corporation of Washington University there, to turn his bequests to good account for botany; will be an endowment quite large enough for the purpose.

Thence, rail — two nights and a day — to Mobile, where it was warm and springlike, but no flowers out, barring an early violet. Thence to New Orleans, which has a great exposition and a crowd, and where, in a sudden change to cold, I caught a dreadful cold. It began with such a hoarseness that, going, Mrs. G. and

I, to dine with Dr. Richardson (son-in-law of Short), where we met your and Dyer's friends, Mr. and Mrs. Morris[1] of Jamaica, I was taken speechless. I was only for a few hours at the Exposition (I hate such), but Mrs. Gray went a second time to see Mexican things. Dr. Farlow, joining us at New Orleans, brought, to our surprise, passes for us to go by the Mexican Central Road to the city of Mexico and back to El Paso (the junction with the road to California), and we decided to undertake it. One day and a night took us to San Antonio, Texas, where we stayed Saturday, Sunday, and Monday, till evening, trying to recover from our colds, driving over the country through chaparral of mesquite bushes (Prosopis) and opuntias. When we awoke next morning we were coursing along the rocky banks of the Rio Grande del Norte, mounting into a high region more arid still, if possible, the only flowers out a Vesicaria; and descending into a great cattle ranch region we reached El Paso at 3.30 A. M.; got to bed again; had the day there and on the other side of the river, at El Paso del Norte, in the Mexican State of Chihuahua, whence at evening we took our Pullman for three nights and two days' journey to this place, through Chihuahua, Zacatecas, Aguas-Caliente, Leon, etc., reaching here yesterday morning at 8.30. We are comfortably placed in the Hotel Iturbide. Farlow and I have looked about somewhat, though I am still suffering from catarrh and cough; Mrs. Gray laid up with hers. This afternoon a Mexican gentleman to whom we took letters called and drove Farlow and me out to Chapultepec, whence a most magnificent view of the whole Valley of Mexico and the surround-

[1] Daniel Morris, assistant director of the Royal Gardens, Kew.

ing mountains, including Popocatapetl and its more broadly snowy companion, — with its more difficult name, meaning White Lady, — at this season always with cloudless tops. The cypresses of Chapultepec are glorious trees, plenty of them, full of character, and of a port which should help to distinguish the Mexican species from the North American. I wish you could see them. And such old trees of Schinus molle, the handsomest of trees either old or young, the old trunks wonderfully bossed. Is it a native of Mexico? I thought only of Chili. But it is well at home here.

Such yucca trees as we have seen on the way here, with trunks at base two or three feet in diameter, weirdly branched, looking like doum palms. Opuntias of two or three arborescent species, some huge, and other cacti not a few.

I have still to compare Arizona with the plateau of northern Mexico. But I see they are all pretty much one thing. . . .

ORIZABA, February 27, 1885.

Since my former sheet, Farlow and I have been mousing about the city of Mexico, I coughing most of the time, in a clear, dry air and nearly cloudless sky, weather which should be most delightful, but somehow it is bad for the throat (for the natives as well as for us), and the rarefied air puts one out of breath at a little exertion; mornings and evenings cool and fresh, the midday warm, in the sun trying. . . . Called in a physician, a sort of medical man to American embassy, who came here with Maximilian, and stayed. Very intelligent. Ordered us to come here as soon as Mrs. Gray could travel. Here only

4,028 feet and a warmer damp air. Well, we tried it yesterday; had to leave city of Mexico at 6.15 A. M., our hotel at 5.30 cold, no breakfast; had to travel till ten or nearly before we could get even a decent cup of coffee, at junction of road to Vera Cruz and Puebla, and after rising to 8,333 feet in getting out of the Valley of Mexico; but at 1 P. M., at Esperanza, in the Tierra Frias, had a capital dinner, and met train from Vera Cruz. Here pine-trees on the hills all round us, two species. Soon begins the descent and a complete change of air, the other side all dry and horrid dust, making our catarrh worse than ever; now the moisture from the Gulf of Mexico makes all green; the road by skillful engineering pitches down 4,000 feet to this, the greater part of the descent all in eight or nine miles of straight line as the bird flies. In all the Valley of Mexico and to the north of it really nothing in blossom yet, all so dry, except Senecio salignus, if I rightly remember the name, a shrub of 1–4 feet, just becoming golden with blossoms. But the moment we began the descent all was flowery, two species of Baccharis, Eupatoria, Erigeron mucranatum (so much cultivated under the false name of Vittadenia triloba), Lœseliæ species, Arbutus, (Xalapensis) in bud, and many things of which we shall know more when we return over the route. . . . Very comfortable hotel here. Botteri[1] left an élêve here who knows something of botany, but lives out of reach on a hacienda. We found a garden combined with a small coffee plantation. The proprietor thereof, speaking a little French, has filled his ground with a

[1] Matteo Botteri, died in 1885. Sent to Mexico by London Horticultural Society. Made fine collections, especially about Orizaba, where he settled.

lot of things that will stand here. It is just *in medias res*, two hours below Tierra Frias, two above (or at Cordoba, only seventeen miles, but 2,000 feet lower) true tropical. Papaya fruits here, also Persea gratissima, etc. And the oranges are delicious. I have passed the whole morning with the garden man, while Farlow went up a small steep mountain, and brought back various things. We shall drive this afternoon to the Cascade of Rincon Grande (cascades are most rare in Mexico).

The air here suits us; shall try to leave our coughs here and at Cordoba below.

On the way here had views of Popocatapetl and the more beautiful and diversified Iztaccihuatl from the sides, and wound round the base of Mt. Orizaba. A true Mexican town this. Mrs. Gray enjoying sights from the window; will be able to drive out this afternoon, though the clouds are sinking too much and mist gathering, a great contrast to the city of Mexico.

P. M. — We went, but saw the falls (very picturesque) in a wet mist, and for botany got a lot of subtropical Mexican plants, the like of which I never saw growing before: among Compositæ, Lagascea (large heads), Tree Vernonias of the Scorpioides set, Calea, Andromachia, etc., etc.

CORDOBA, March 2, 1885.

. . . To continue. On Saturday, a fine and sunny morning, Farlow and I drove off for the Cascade of Barrio Nuevo, almost as beautiful as the other, and had a long morning in clambering and collecting. In the grounds on the way are planted trees of a Bombacea, in flower before the leaf, probably Pachira. The peak of Orizaba shows as a narrow streak of white

over a near mountain, from the windows of our room; but by going half a mile east the whole comes out splendidly.

Sunday morning we were comparatively quiet, but at 3.50 P. M. we were off for Cordoba, less than an hour distant by rail, and 2,000 feet lower. A queer little town, with only a poor, truly Mexican inn, a set of rooms in the single story, all round a patio, into which the country diligence drives, and on rear side the stables back against the rooms, as Farlow found to his discomfort, only a thin wall between his room and the horse's mangers. Tile floors, cot-beds, but clean, and the food certainly better than was to be expected.

Fine view of Orizaba. An American, Dr. Russell, here, whom I looked up. And he took us to an American German, Mr. Fink, who collects Orchids, etc., commercially. He took us to a garden, and we were going to the river bank and ravine, but, though out of season, rain set in, and we came home rather wet.

I fear our afternoon excursion may be lost, but it now looks like clearing. The way from Orizaba here is magnificent, for mountains, railroad-engineering, and culture vegetation. I hope we can get into some wild tropical vegetation, but uncertain; can stay here only to-morrow at most. We are cut off from news of all the world; little could we get in Mexico city, less since. . . .

You would be amused, as I have known you to be in Italy, at my knack of explaining myself by gesture, and so getting on. . . .

LATHROP, CALIFORNIA, May 1, 1885.

We have only this morning left Rancho Chico and have set our faces eastward. Waiting for our train I improve the rare bit of leisure to write a line.

First of all, we are both well. No cough, however obstinate, could abide this charming climate. And having no excuse for further stay we enter upon the "beginning of the end" of a holiday which now only lacks ten days of three months. What a pity to turn our backs on all the fruits we see growing around us, having enjoyed only the cherries, which are just coming in. Well, we have a basket of them, as big as plums, and so good! to solace the first days of the desert part of our journey. We shall have desert enough on the way home, as we cross Arizona and New Mexico by the Atlantic and Pacific railway, through the northern part of those Territories (having come out by the southern), a country quite new to us. How often we have wished for you and Lady Hooker!

When and whence did I write you last? I think from Los Angeles and before our trip to San Diego.

Instead of a short journey by sea (which my wife detests) we made a long circumbendibus by rail to the southernmost town in California; declined an invitation to go over the border into Mexican California; was, in fact, too unwell to do anything in the field, and so, finding the coast too cool and damp, returned, stopping two nights with Parish and wife, at their little ranch at San Bernardino, in a dry and warm region, a charming valley girt with high mountains, on the eastern side still snow-topped, — indeed they are so most of the summer. Back thence to Los Angeles we soon went, down to the port San Pedro, and took steamer for Santa Barbara, the very paradise of Cali-

fornia in the eyes of its inhabitants, and indeed of most others. Our cruise of only eight hours on the Pacific was pleasant, and most of it in daylight.

Arriving after dark, we found, to our surprise, the mayor of the little town on the wharf with a carriage for our party (wife, Farlow, and self), who drove us to the fine watering-place kind of hotel, and on being shown at once to our rooms we found them all alight and embowered in roses, in variety and superbness such as you never saw the beat of, not to speak of Bougainvilleas, Tacsonias, and passion-flowers, Cape-bulbs in variety, etc., etc., and a full assortment of the wild flowers of the season. Mrs. Gray was fairly taken off her feet. During the ten or eleven days we stayed, there were few in which we were not taken on drives, the most pleasant and various. The views, even from our windows, of sea and mountain and green hills (for California is now verdant, except where Eschscholtzia and Bahias and Layia, etc., and Lupines turn it golden or blue) were just enchanting; and on leaving we were by good management allowed to pay our hotel bill. . . . Had you been of the party I believe the good people would have come out with oxen and garlands, and would hardly have been restrained.

Here we were driven out fifteen miles to one of the great ranches, — a visit of two nights and a day, — that of Mr. Cooper, a very refined family; the whole ranch flanked on the windward sides by eucalyptus groves, apricots, almond, peach-trees, etc., by the dozens of acres; but the produce on which the enthusiastic owner has set his heart is that of the olive, and he makes the best of olive oil, and in a large way. Hollister's ranch is still larger, miles long every way; both reach from mountain-top to sea, and have fine

drives up cañons, in these fine oaks and plane-trees, occasionally an Acer macrophyllum and an Alder. Avoiding the sea, which gives a short route, we reached San Francisco by a lovely drive, in a hired wagon, over a pass in the Santa Inez Mountains to the coast (south) at Ventura, and so up the broad and long Santa Clara Valley to Newhall, on the Southern Pacific railway, not very far above Los Angeles (two days' drive, most pleasant), then by rail overnight and to this place to breakfast, and on to San Francisco.

We stopped this time at the Lick House, where we had, European-wise, a room, not quite so good as we had at the Palace Hotel eight years ago, and fed at the restaurant, very nice and reasonable, when we were not visiting or invited out, which was most of the time. So it was not expensive, our room (parlor, bedroom shutting off, and a bathroom) costing only about 12 shillings for us both. Harkness looks the same, but older; is absorbed in fungology. Here again we were made much of for twelve days, most busy ones. General McDowell, who you remember dined us at the "Palace," is ill; we saw him twice, and he has since so failed that we daily expect to hear of the end.

May 4. In Farlie's Chalet hotel in the Grand Cañon of the Colorado.

Dr. Brigham, you remember, who took us to the Chinese theatre, is now married, and has three children by a bright wife, with a rich father, and a handsome house, above Presidio, — a fine site, and filled with fine things from all countries, and such a rose-garden; gave us a handsome dinner. Alvord and wife (president now of Bank of California), noble people, did wonders for us, and a dinner and drives. A lunch over at the university; and another by General (commanding the

Western Department in place of McDowell, and in the choice house the latter built) and Mrs. Pope (she an old acquaintance); then we went over to San Rafael, a night with the Barbers, and next day a drive up behind Mount Tamalpais to the cañon reservoir of water-works, and saw, at length (having failed on all former visits), that huge Madroña (Arbutus Menziesii), like one of those great and wide-spreading oaks you used to admire. Next day to Monterey, which we saw nothing of on that hurried visit eight years ago, when our single day was sacrificed to Hayden's insane desire to see a coal mine on a bare hill! Now there are eighteen miles of good drive around all Point Pinos and through it, and Cupressus macrocarpa on the seaside verge, noble and picturesque old trees, and no lack of young ones, a little back, and grand sea and shore views.

On the other side of the town, in a grove of great live oaks and Pinus insignis mixed, made into a beautiful park and park gardens, with a separate railway station in the grounds, is the crack hotel of the Western coast, the work of the Pacific Railway Company, which has also bought and appended the whole of the pine grove, five or six miles long and two or three wide, thus preserving Pinus insignis and the cypress, the latter much needing it.

Mr. and Mrs. Alvord, knowing our visit was to be, had telegraphed for best rooms, and joined us unexpectedly; took us on the long drive the next day, with four fine horses. . . . They showed us no end of kind attention.

At length we got off for a visit to Chico (leaving Farlow to algologize at Santa Cruz, etc.), a quicker way than before, a steam-ferry across Suisin Bay help-

ing. And there we had a nice time indeed, from Saturday evening to Friday morning, every day, drives and picnics, and botanizing, and feeding on (besides strawberries) such cherries, just coming in in acres of cherry-orchards, the only fruits yet in season. That big fig-tree, in the branches of which I used to hide and feast, or rather cram, is bigger than ever, but the figs green, to my sorrow. And we cannot wait for them. General Bidwell[1] and wife have aged little in the eight years, are as good as ever, full of all noble and good works, as well as of generous hospitality; have taken wonderfully to botany; remember you most affectionately and long for a real visit. His great ambition is to make drives, good roads, through the ranch, for pleasure as well as use; he has now over a hundred miles of them. That big oak[2] is finer than ever; not a dead branch.

Well, off at length; at Lathrop joined our eastward train at evening; up the San Joaquin valley all night, and had early morning for the wonderful Tahachapi Pass. Breakfast at Mohave. (I must send you a railroad map.) There took the Atlantic & Pacific Railroad, over the sandy desert to the Great Colorado at supper, to Peach Spring station at two A. M., and next morning in an easy "buckboard wagon" twenty-two miles and 4,000 feet descent into this wonderful cañon, a piece of it, which its explorer, Major Powell, has made famous.

This afternoon and evening we are to get up and back, and on in the night and morning to Flagstaff, and the ancient cliff dwellings.

[1] General John Bidwell was the Prohibition candidate for the Presidency in 1892.

[2] Named the Sir Joseph Hooker Oak.

In the Cars, Kansas City, May 8, 1885.

Let me finish up these mems. We have now only a run of eleven hours to St. Louis, where we stay three or four days with Dr. Engelmann (Jr.), and then home.

The cañon trip well repaid the journey and its rough accessories. Some of the views are of those depicted by Powell. We find that Tylor and Moseley were here last year. As the man whom we had introductions to at Flagstaff was absent for a day or two, though we found he had left substitutes, and as we wanted to get home as soon as we could, we gave up the visit to the cave and cliff dwellings. I dare say the models in clay, made at Washington, are as good as the originals. So we came on, one and a half nights and two days, and to-night we shall sleep in beds at St. Louis. We bear this sort of travel quite well. From Mohave to the Colorado is very sandy and complete desert, descending eastward many hundred feet. Near Mohave lots of tree yuccas, looking very like those in northern part of Mexico. From the Colorado to Peach Spring we passed in the dark, but had risen to about 6,000 feet, and we kept on an elevation of 4,000 to nearly 8,000 feet all across the rest of Arizona and New Mexico, the higher parts wooded with conifers, that is, Pinus ponderosa of the Rocky Mountains form and Juniperus. At Las Vegas, New Mexico, we laid over one train, to rest and visit the Hot Springs; no great to see, except a spick and span new hotel, too fine for the place, and some very hot water.

Well, this trip, which will nearly round out to three and a half months, has been long and enjoyable indeed.

At St. Louis will be letters, perhaps one from you.

Ever yours, A. Gray.

Part of yesterday and last night was down along the Arkansas, the reverse of our journey eight years ago. Country much settled up.

CAMBRIDGE, August 26, 1885.

. . . Charles Wright is dead, at seventy-three and a half; had been suffering of heart-disease, went out to his barn, was missed as the evening drew on, was found dead. So they go, one by one. . . .

The summer is almost gone, — one hardly knows how, — but, then, we have a longer and finer autumn than you have in England.

The five hundred copies which I printed in 1878 are gone. And, as I have to print new copies, I take the opportunity to correct on the stereotype plates when I can, — a great lot of wrong references to volume, page, plates, — that is, such as we have found out. What a bother they are, and how impossible to make correct in the first place, and to keep so through the printer's hands! Then there are lots of important corrections to make, and new species and genera galore.

So, — in an evil moment, you will say — I set about a supplement to this new issue, — also of the other part. For, as I have now brought out in the two parts all the Gamopetalæ, and as I begin to doubt if I shall hold out to accomplish much more, I thought it best to leave behind at least these in good state. But it is no small job. And this, with the great amount of herbarium work that goes along with it, or beside it, just uses up the summer; for I dare guess it will keep me occupied all September. . . .

The last news of you is a letter from your dear wife to mine, — giving such a pleasant picture of the

two boys, and of your enjoyment of them. You say you are quite well, and Lady Hooker much the same, — which is comforting. But you are naturally growing older, like myself. I tire sooner than I used to do, and have not so sure a touch nor so good a memory. The daily grind we both find more wearing. . . .

We should like to come over to you once more, — but it seems less and less practicable; unless I become actually unfit for work, and then I shall not be worth seeing. . . .

Your affectionate old friend, A. GRAY.

Old, indeed; the president of the Naturæ Curiosorum wrote me on August 3 that I have been one of the *curious* for fifty years.

Dr. Gray wrote a notice of Charles Wright for the "American Journal of Science," in which he says that "Charles Wright was born at Wethersfield, Connecticut; graduated at Yale in 1835. Had an early love for botany, which may have taken him to the South as a teacher in Mississippi, whence he went to Texas, joining the early immigration, and occupied himself botanizing and surveying, and then again in teaching. He accompanied various expeditions, and no name is more largely commemorated in the botany of Texas, New Mexico, and Arizona than Charles Wright. It is an acanthaceous genus of this district, of his own discovery, that bears the name of Carlowrightia. Surely no botanist ever better earned such scientific remembrance by entire devotion, acute observation, severe exertion, and perseverance under hardship and privation." He was engaged later for several years "in his prolific exploration of Cuba."

"Mr. Wright was a person of low stature and well-knit frame, hardy rather than strong, scrupulously temperate, a man of simple ways, always modest and unpretending, but direct and downright in expression, most amiable, trusty, and religious. He accomplished a great amount of useful and excellent work for botany in the pure and simple love of it; and his memory is held in honorable and grateful remembrance by his surviving associates." [1]

TO JOHN H. REDFIELD.

CAMBRIDGE, November 3, 1885.

MY DEAR REDFIELD, — I was interested in your Corema Con.

I have a remark to make on the last sentence of it; I would ask, How could the plant have an introduction following the glacial period? And where could it have come from?

Of course my idea is that it existed at the higher north before the glacial period — that is my fad.

But one sees that this is one of a few plants that may be appealed to in behalf of an Atlantis theory, — as coming across the Atlantic, making this Corema a derivation from C. alba, of Portugal, or of *its* ancestor. But the Atlantic is thought to be too deep for an Atlantis; and we do not need it much.

What induces me to refer to your paragraph is to ask whether your "following the glacial period," that is, recent introduction, means in your thought that our species is a direct descendant of Corema alba, which by some chance got wafted across the Atlantic.

[1] *American Journal of Science*, 3 ser. xxxi, 12. — 1886. Reprinted in *Scientific Papers*, selected by C. S. Sargent, vol. ii. p. 468.

That is the most probable notion, next to my theory.

For consider, we know the genus only on these two opposite shores.

Perhaps — so far as I know, there is no more C. alba in the Old World than C. Conradii in the New. And if it were in New England that the former occurs, we could say that the Old World received the genus from the New — via the Gulf Stream.

November 6.

. . . I start farther back than the retreat of the glaciers. I suppose that the common ancestor of both Coremas was in the high north before the glacial period, and that the two, in their limited but dissociated habitats, are what is left after such vicissitudes!

In that view it does not matter how long New England coast was under water. Our plant and its companions were then further south or west.

Yours ever, A. GRAY.

On the approach of Dr. Gray's seventy-fifth birthday it was suggested among the younger botanists that some tribute of love and respect should be presented to him. Accordingly a letter was sent to all botanists whose addresses could be obtained within the very limited time. A silver vase was decided upon, and designs furnished, which were most happily and beautifully carried out. The description, copied from the "Botanical Gazette," gives its size and decorations.

"It is about eleven inches high exclusive of the ebony pedestal, which is surrounded by a hoop of hammered silver, bearing the inscription '1810, No-

vember eighteenth, 1885 — Asa Gray — in token of the universal esteem of American Botanists.'

"The decoration of one side is Graya polygaloides, surrounded by Aquilegia Canadensis, Centaurea Americana, Jeffersonia diphylla, Rudbeckia speciosa, and Mitchella repens. On the other Shortia galacifolia, Lilium Grayi, Aster Bigelovii, Solidago serotina, and Epigæa repens. The lower part of the handles runs into a cluster of Dionæa leaves, which clasps the body of the vase, and their upper parts are covered with Notholæna Grayi. Adlumia cirrhosa trails over the whole background. The entire surface is oxidized, which gives greater relief to the decorations."

Greetings in the form of cards and letters, sent by those who gave the vase, were placed on a silver salver accompanying the gift, with the inscription, "Bearing the greetings of one hundred and eighty botanists of North America to Asa Gray on his seventy-fifth birthday, November 18th, 1885."

Dr. Gray was exceedingly touched and delighted, as well as overwhelmed with surprise. And the day, with pleasant calls and congratulations from friends and neighbors, gifts of flowers with warm and kindly notes, was made a memorable one indeed.

His response to the senders of the vase was printed and sent to all who could be reached.

HERBARIUM OF HARVARD UNIVERSITY,
CAMBRIDGE, MASS., November 19, 1885.

To J. C. Arthur, C. R. Barnes, J. M. Coulter, Committee, and to the numerous Botanical Brotherhood represented by them:

As I am quite unable to convey to you in words any adequate idea of the gratification I received on the morning of the 18th inst., from the wealth of con-

gratulations and expressions of esteem and affection, which welcomed my seventy-fifth birthday, I can do no more than render to each and all my heartiest thanks. Among fellow-botanists, more pleasantly connected than in any other pursuit by mutual giving and receiving, some recognition of a rather uncommon anniversary might naturally be expected. But this full flow of benediction, from the whole length and breadth of the land whose flora is a common study and a common delight, was as unexpected as it is touching and memorable. Equally so is the exquisite vase which accompanied the messages of congratulation and is to commemorate them, and upon which not a few of the flowers associated with my name or with my special studies are so deftly wrought by art, that of them one may almost say, "The art itself is nature."

The gift is gratefully received, and it will preserve the memory to those who come after us of a day made by you, dear brethren and sisters, a very happy one to

Yours affectionately, ASA GRAY.

TO S. M. J.

November 19, 1885.

We meant our day to have been most quiet, and I completely and J. largely were taken by surprise. So we had to send for two or three neighbors, especially to see the vase.

J. will bring it in to you, no doubt, for she is very proud of it. The lines I have already written have taken all the strength out of my right arm, but not all the love out of my heart, of which a good share is yours.

TO W. M. CANBY.

CAMBRIDGE, November 19, 1885.

MY DEAR CANBY, — Many thanks for your felicitations. There is much I want to write, and to say what a surprise we had, and how perfect the vase is. But my arm is worn out with note-writing.

Yours affectionately, ASA GRAY.

Two poems and a poetical epigram came among the rest!

TO SIR EDWARD FRY.

CAMBRIDGE, January 31, 1886.

MY DEAR FRIEND, — I am a laggard correspondent, I fear. Here are your two most friendly and interesting letters, as far back as November, one of which crossed, and one which announced, the reception of my long letter which gave a sketch of our journeyings which began almost a year ago. For we are now already in the middle of another winter. I doubt if we shall flee from this one, although it has shown some severity. In the first place, we may thankfully say that neither Mrs. Gray nor I can say that we require it; and I cannot bear to lose the time: I seem to need the more of this as the stock diminishes; for, somehow, I cannot get as much done in a day as I used to do. Moreover, it is no good running away from winter unless you can go far. For our southern borders have been unusually wintry, and they want our guards and preparations against cold. . . . We were glad enough to get back to our well and equably warmed house, where, indeed, we are most comfortable.

You called my attention, I believe, to Professor Allen's book on the "Development of Christian

Doctrine." I take shame to myself that I did not procure and read it. But I know its lines, and read some part of it before it was in the book, and, of course, I like it much.

I am going, in a few days, to send you a little book, with similar bearings, which I read in the articles of which it is made up. I think you will find much of it interesting.

Bishop Temple's "Bampton Lectures" seemed to me very good as far as it went, but hardly came up to expectation.

I saw something of Canon Farrar when here. He pleased well, and I think was well pleased; and personally he was very pleasing and lovable.

I wish more of the English Churchmen would visit us, and give more time especially to the study of their own branch of the church in the United States, — a very thriving one. I think they might learn much that would be helpful and hopeful, — difficult as it may be to apply the experience and the ways of one country to another.

I have seen, but not read, Mr. Forbes's "Travels in Eastern Archipelago." Those who have read it here say it is very interesting. We have a great lot of his dried plants from Sumatra and Java, unnamed, which at odd hours I am arranging for the herbarium. I hope that in his new journey he will manage to make better specimens. But, as he is primarily an entomologist, this can hardly be expected. But, if I rightly understand, he goes out now with a good backing and probably better conveniences for collecting than he could have had before.

We have been, and still are, much interested in English politics and election excitements. You are

having very anxious times, indeed. What a pity that some one party, that is, one of the two great parties, is not strong enough, and homogeneous enough, to command the situation for the time being, and to deal independently of Parnell, or, indeed, of Chamberlain. . . .

We Americans are wonderfully peaceful — our only real questions now pending are financial, and those not yet treated as they ought to be, on party lines. We have an awful silver craze; but we hope to arrest it before it comes to the worst, though sense and argument are at present ineffectual.

We have a comfortable trust in the principle that "Providence specially protects from harm the drunken, the crazy, and the United States of America."

I see our friend Professor Thayer now and then. He is well and flourishing. Mrs. Gray and I are very well indeed, and we send our most cordial good wishes to you all.

Very sincerely yours, ASA GRAY.

TO J. D. HOOKER.

CAMBRIDGE, March 9, 1886.

When I read A. de Candolle's notice of Boissier, I thought it was "charming." Anyhow, it brought back to me the charming memory of a very lovable man. I dare say neither De Candolle nor I has done justice to Boissier's work. I could only touch and go, — make a picture that would just sketch the kind of man he was.

. . . Yes, I have got on Ranunculaceæ, and have done up to and through Ranunculus, minus the Batrachium set, of which happily we have few in North

America, that we know of. But having done some while ago the Gamopetalæ of Pringle's interesting North Mexican collection, I am now switched off to the same in a hurried collection made by Dr. Palmer, in an unvisited part of Chihuahua, in which very much is new. One after another those Mocino[1] and Sessé plants turn up. Also those of Wislizenus, whom the Mexicans for a time interned on the flanks of the Sierra Madre.

We are bound to know the botany of the parts of Mexico on our frontier, and so must even do the work. Pringle goes back there directly, with increased facilities, and will give special attention to the points of territory which I regard as most hopeful.

Trelease,[2] our most hopeful young botanist, — established at St. Louis, — is here for a part of the winter, to edit a collection of the scattered botanical publications of Engelmann which Shaw pays for — or at least pays for to a large extent. He would have the plates and figures, and that will double the cost and the sum Shaw offered to provide. We may have to sell some of the edition in order to recoup the charges. . . .

Yes, you hit a blot. I can see to all my own books, such as the "Synoptical Flora." But, somehow, I cannot restrain the publishers from altering the date of their title-pages when they print off a new issue from the stereotype plates. . . .

[1] Josef Mariano Mocino. Was on the coast of California in 1792. Botanized in Mexico, especially in the northern part. His drawings, brought to Europe after the death of Sessé, were left with Aug. Pyr. de Candolle. When suddenly reclaimed they were copied for him by the united labors of the ladies of Geneva.

[2] William Trelease, St. Louis; professor of botany at Washington University, and director of Missouri Botanical Garden.

What do I call an alpine plant? Why, one that has its habitat above the limit of trees — mainly — though it may run down lower along streams. But in a dry region, where forest has no fair chance, we might need to mend the definition.

Upon your paper, I got a few notes — offhand, by references.

I premise that in New England we have two places where several alpine plants are stranded at lower levels than they ought, peculiar conditions of configuration and shelter having preserved them, while the exposed higher grounds have lost them. They are Willoughby Mountain and the Notch of Mt. Mansfield, Vermont.

As to your III. Of the whole list of alpine plants of Oregon and northward and not of California, I can put my hand upon only two that are yet known in California, viz., Armania verna and Vaccinium cæspitosum, which comes in its var. arbuscula only.

There is a great lack of alpine arctic plants in California. First, because there is not much place for them now; secondly, because there have been such terrible and vast volcanic deposits — lava and ashes — that they must have been all killed out.

But for all these matters we shall one of these days have fuller and surer data — after my day. Well, I must stop. . . .

TO A. DE CANDOLLE.

CAMBRIDGE, June 29, 1886.

MY DEAR DE CANDOLLE, — Your letter and inclosure of the 15th inst. gave me much pleasure. Not only had I a natural curiosity to know more of

Coulter,[1] but also I find it important to know his routes in Mexico and California.

At Los Angeles, last year, I fell in with one of the "old settlers" who knew him, and who accompanied him on that expedition into the Arizona desert on the lower Colorado. Mr. Ball will ascertain and let me know other particulars of the man, and the date of his death, which probably occurred not long after that last letter to you, from Paris.

In various ways I am convinced that I am on the verge of superannuation. Still I work on; and now, dividing the orders with Mr. Watson (who, though not young, is eight or ten years my junior), we are working away at the Polypetalæ of the "Synoptical Flora of North America," with considerable heat and hope. But it is slow work!

Tuckerman, our lichenologist, has gone before us! I shall in a few days send you a copy of the memorial of him which I contributed to the Council report of the American Academy of Sciences and am having reprinted in the "American Journal of Science" for July.

My wife is fairly well. . . . She is always busy; and we both enjoy life with a zest, being in all respects very happily situated, particularly in having plenty to do.

Let us hope that you may still be able to give us better accounts of Madame de Candolle and of yourself; and believe me to be always,

Yours affectionately, ASA GRAY.

[1] Thomas Coulter. Little is known of him. He explored in Mexico many years and in California in 1831 and 1832. Was appointed Curator of the herbarium of the Dublin Botanic Garden, where he died in 1843.

TO J. D. DANA.

BOTANIC GARDEN, CAMBRIDGE, MASS., September 20, 1886.

MY DEAR DANA, — Well! "the books" have just come.

I suppose you are in no hurry for notices of them, and would prefer short ones. . . .

I rather like to do such things incog., as in the "Nation," in which I sometimes take a shot at this or that.

I and wife are well, — very.

Had a week in Old Oneida, which still looks natural. I am grinding away at "Flora," and probably shall be found so doing when I am called for.

Very well! I have a most comfortable and happy old age. Wishing you the same,

Yours ever, A. GRAY.

TO J. D. HOOKER.

CAMBRIDGE, September 15, 1886.

. . . Has Ball returned to England? If so, please tell him that he promised to look up in Dublin, and give from his own knowledge, some details of Coulter's life. Alphonse de Candolle has sent me copies of what letters he has, and they enable me to trace Coulter's movements and whereabouts, which is helpful.

Old Goldie,[1] your father's correspondent lang syne, died only this summer, very old.

My last bit of work was upon our Portulacaceæ for my "Flora." The genera are thin. It is as much as one can do to keep up Montia (though if that fails

[1] John Goldie, 1793–1886. Traveled in North America, 1817 to 1820, collecting plants. After his return to Scotland emigrated to Ayr, Ontario, 1844, where he died.

Claytonia should go to it rather than the contrary, by right, — but convenience would call for the contrary), also Spraguea.

I have been having a holiday. A fortnight ago my wife and I set out; made a visit to my natal soil, in the centre of the State of New York, in Oneida County; had a gathering of the surviving members — most of them — of the family, of which I am the senior, — two widowed sisters (one a sister-in-law), there resident, and an older one who came with her husband from Michigan; my oldest brother and family, who have the paternal homestead; the unmarried sister, who passes all her winters with us; children and some grandchildren. One brother, a lawyer in New York, and residing near by in New Jersey, with wife and two boys, did not come. Another absent nephew is in California, well settled there.

It is a pretty country, the upper valley of the Mohawk and of tributary streams from the south, which interlock with tributaries of the Susquehanna, at a height of 1,000 to 1,500 feet above tide-water, beautiful rolling hills and valleys, fertile and well cultivated, more like much of rural England than anything else you saw over here. We wished you and Lady Hooker could have been with us in our drives. The summer air is just delightful, soft and fresh.

On our return we struck off and visited my brother Joe and family, in the environs of New York, and so came home much refreshed — though, indeed, I hardly felt the need of a holiday.

Sargent has just started for a trip to the southern part of the mountains of North Carolina, — a region we are fond of and long to show you.

Now I am going to pitch into Malvaceæ. I am

quite alone. Goodale took off Sereno Watson with him, on a slow steamer to Amsterdam; will run for a fortnight or so over nearer parts of the Continent, and Watson will look in at Kew. He was much worn down, and the rest and change will be good for him. I have filled my sheet with this gossip.

It was during this visit that Dr. Gray, when the family gathered one morning for breakfast, had disappeared. He came in smiling when the meal was half over, and in answer to the anxious question where he had been, said, "Oh, I have been to say to Mrs. Rogers that I forgave her for getting above me in the spelling-class."

CAMBRIDGE, October 31, 1886.

DEAR HOOKER, — Thanks for a nice long letter from Bournemouth, September 27. Thanks, too, for the hope — though rather dim — that you and wife may come over to us in the spring. Before winter is over we must arrange some programme; for we four must meet again somehow and somewhere, while in the land of the living. But how is a problem.

. . . I see how difficult it must be for you to get away as far as to us. Our obstacle to any amount of strolling away is mainly the fear that if I interrupt my steady work on the "Flora of North America," I may not get back to it again, or have the present zeal and ability for prosecuting it.

On the other hand, if I and my wife do not get some playdays now, while we can enjoy them, the time will soon come when we shall have to say that we have no pleasure in them. Therefore we are in sore straits. . . . If really you cannot come, then we will

brave out the winter here, as we did last winter and are none the worse; then we will seriously consider whether Mahomet shall go to the mountain, which will not come to Mahomet.

I grind away at "Flora," but, like the mills of the gods, I grind slowly, as becomes my age, — moreover, to continue the likeness, I grind too "exceedingly fine," being too finical for speed, pottering over so many things that need looking into, and which I have not the discretion to let alone. Consequently the grist of each day's work is pitiably small in proportion to the labor expended on it. I am now at Malvaceæ, which I once enjoyed setting to rights, and of which the North American species have got badly muddled since I had to do with them.

If Sereno Watson — who should be back again in twenty days — will only go on with the Cruciferæ, which he has meddled with a deal, and then do the Caryophyllaceæ, which are in like case, we may by March 1st have all done up to the Leguminosæ.

We learn to-day, through a pamphlet sent by Miss Horner, that Bunbury is dead — in June last. . . .

Your "Primer" — new edition — has not come yet. Do not forget it. And then, as my manner is, I will see if I can find fault with it. Same with Bentham's "Hand-book," new edition. . . .

I do not wonder that you are happy and contented. We should so like to see father, mother, and children in their encampment at Sunningdale. May plenty of sunshine be theirs!

Ball has sent me early sheets of his book. I must find time to go through its pages.

The L.'s abroad, except the two girls (who are to winter at San Remo) are now en voyage homeward.

William, their father, has been painted by Holl. He is a good subject. Saw your sister B. (and kind Lombe); she writes a charming letter to my wife; seems to hold her own wonderfully.

CAMBRIDGE, November 22, 1886.

Well, I have got safely through my seventy-sixth birthday, which gives a sort of assurance. I have always observed that if I live to November 18, I live the year round!

You are working at Euphorbs, etc.; I at Malvaceæ, in which I find a good deal to do for the species, and something for the betterment of genera. . . .

TO SIR EDWARD FRY.

CAMBRIDGE, November 13, 1886.

MY GOOD FRIEND, — Let me turn for a moment to our quarter-millennial celebration of the foundation of our university, though you in Europe may count our antiquity as very modern. It was an affair of three days, culminating on Monday last, and was altogether very pleasant. You will like to know that among the honorary degrees given, was one to Professor Allen, of the Episcopal Theological School here, in recognition of the merits of his "Continuity of Religious Thought," which work, I am glad to remember, you much liked. The Mother Cambridge sent to us the master of St. John's, Dr. Taylor, and Professor Creighton, of Immanuel College, to which the founders and first professors of Harvard belonged. Mrs. Creighton came with him, and we found them pleasant people. I suppose Lowell's oration, Holmes's poem, and the doings in general will be in print before very long, and I shall not forget to send you a copy.

We have been away from Cambridge very little this last summer and autumn, only on very short visits, or one rather longer one to my birthplace in the central portion of New York, where we had a family gathering.

There is a lull just now in your political situation. I certainly at your last election should have gone against Gladstone! How so many of my countrymen — I mean thoughtful people — approve of home-rule, i. e., of semi-secession, I hardly understand. But local government as to local affairs is our strength, and is what we are brought up to. Also, our safety is in that the land — the agricultural land — is so largely owned by the tiller. . . .

We should like to see old friends in England once more in the flesh, and the feeling grows so that I may feign a scientific necessity, and we may, if we live and thrive, cross over to you next summer. At least we dream of it, though it may never come to pass.

TO J. D. HOOKER.

CAMBRIDGE, January 18, 1887.

MY DEAR HOOKER, — Glad to see the "Botanical Magazine" figure of Nymphæa flava †.6917.

There is something not quite right in the history as you give it. Leitner was the botanist who showed the plant to Audubon, and gave it the name which Audubon cites, and he died — was killed by the Florida Indians — "half a century ago." He was the "a naturalist" you refer to.

The whole history and the mode of growth, stolons, etc., has been repeatedly published here in the journals, etc. See Watson's "Index" Supplement, etc. Not that this is any matter, even about poor Leitner.

CAMBRIDGE, January 25, 1887.

. . . Yes, it has seemed to me clear that you could not cross the Atlantic at present. And so it logically follows that we must.

I had been coming to this conclusion, and only the day before your letter arrived my good wife and I had put our heads together and concluded that, if nothing occurred meanwhile to prevent, we would cross over, say in April. It is time we set about it, if we are ever to do it; and several things seem to indicate that this is a more favorable time than we can expect later.

As this will be "positively Dr. Gray's last appearance on your shores," we must make the most of it. Shall we have a Continental jaunt together, or shall you be too much tied to home?

Meanwhile I must work hard and steadily. . . .

As you "weed out" surplus of herbarium Kew, keep them for me. When I come I will take care of them. It is (as usual) good of you to think of us. You have done so for so long a time that it is only "second nature" — very good nature too.

Williamson, plant-fossil, long ago begged us to come to British Association at Manchester, and be his guests. If I do, what think you of my preparing a paper for Botanical Section; and will you join me in it? two venerables — *anglice* old fogies — on Nomenclature and Citations.

There are some points I should like to argue out and explain; to put on record, though it may be of no use. Not that one wants to get up a discussion in such a body — that would never do. . . .

CAMBRIDGE, February 22.

Thank you for sending me your edition of Bentham's "Handbook," which looks well in its more condensed shape, and in which I dare say you have put a good deal of conscientious work. But it seems to me that Reeve & Company give it poor type and paper.

I am putting through a rehash of my "Lessons in Botany,"[1] more condensed, yet fuller, and with a new name. This, with the companion book, which I must live to do over, *Deo favente*, is the principal thing for bread, and I need it for an endowment to keep up the herbarium here, after my time.

Well, — don't speak of it aloud, — we have secured our passages for April 7, and if I can get present work off my hands in time, we may be on your soil soon after Easter.

You may imagine me very busy, indeed.

Yours affectionately, A. GRAY.

Dr. Gray, with Mrs. Gray, landed in England, April 18, and went from Liverpool to stay at Sunningdale with Sir Joseph and Lady Hooker, where a quiet, restful week was most pleasantly passed. He went to London the first of May for a few days, meeting again old friends, dining with them, and dropping in for calls, "to report himself," as he said. He did a little work at Kew, going back and forth; then crossed to Paris, finding at the Jardin des Plantes what he had especially wanted to see, Lamarck's herbarium, which had been acquired since he was last there. It completed satisfactorily his studies in Asters, as he had now seen everything of the genus to be found in herbaria of importance.

[1] Dr. Gray returned for this last book to the title of his first book, published in 1836, *Elements of Botany*.

A journey in Normandy with Sir J. D. Hooker had been planned for May, but Sir Joseph was unable to leave England, so Dr. Gray arranged to go to Vienna. He greatly enjoyed the railroad journey from Bâle, in May, the fruit-trees white with blossoms about Lake Zurich, then the wilder mountain scenery, and Salzburg, all bringing back the memories of his first European journey forty-eight years before.

TO A. DE CANDOLLE.

HERBARIUM, KEW, April 23, 1887.

MY DEAR DE CANDOLLE, — You will be a little surprised at the sudden transfer of Mrs. Gray and myself to England; but I wanted a vacation and one more bit of pleasant travel with Mrs. Gray while we are both alive and capable of enjoying it. Whether I shall look in upon you at Geneva is doubtful, but it may be, even for a moment. We never expect to have repeated the pleasant week at Geneva of the spring of 1881.

We expect to go to Paris early in May, but subsequent movements are uncertain.

Always, dear De Candolle, affectionately yours,

ASA GRAY.

TO ——.

May 15, 1887.

I think the journey from Bâle, in Switzerland, to Salzburg was wonderfully fine and a great success, and that May is a good time to do it, while there is plenty of snow in the mountains. Lake Wallenstadt showed to great advantage. And I had no idea that the pass of the Arlberg, from Feldkirk to Innspruck, was so high or so very fine. I believe it is the highest

railway pass across the Alps. I was quite unprepared (which was all the better) for the exquisite and wild, and in parts grand, scenery of the next day's journey through the heart of Lower Tyrol and the Salzburg Salzkammergut, by a slower train, a roundabout road making more than twice the direct distance from Innspruck to Salzburg, through the Zillerthal and over a fairly high pass on to the upper part of the Salzach, and down it through some wild cañons into the plain, from nine A. M. till five, of choicest scenery. The great castle, so picturesquely placed in the Lichtenstein (plain), is Schloss-Werden. Rainy day at Salzburg, or should have had noble views. If the weather had been good, I think we would have driven from Salzburg to Ischl, and then come by the Traunsee to Linz. But after all, from my remembrance, it would hardly have come up to what we had already seen. And though it was a rainy day for the Danube, we did see everything pretty well, and most comfortably, in the ladies' cabin of the steamer, with windows all round the three sides, and most of the time the whole to ourselves, or with only one quiet lady, who evidently cared nothing for the views. J. says I was bobbing all the time from one side to the other. I was looking out for the views which I had when going up the Danube forty-eight years ago. J. thinks it not equal to the Rhine, but there is rather more of it, or scattered over more space.

TO SIR J. D. HOOKER.

HÔTEL BEAU RIVAGE, GENEVA, May 24, 1887.

I do believe we shall have to return to America to thaw out. Here we arrive in Geneva this morning, full of memories of delightful summer, ten days earlier

than this in 1881, to find snow down even to foothills of the Jura and on Mont Salève; it came two days ago, and the air, though clear, is very chilly, which is not to my liking.

Vienna was much better, excepting our last day, which had a cold and high wind, and our night journey to Munich was cold and comfortless, in spite of the best appliances.

I have nothing new to tell you of Vienna, where we made out our full week, quite enjoyingly.

Besides the normal sight-seeing, and drives around this truly magnificent city, we went one afternoon to the astronomical observatory out at Wahring (Weiss and wife being old acquaintances), and next day they went with us to the Prater. Körner and daughter took us to Schönbrunn. I went with these to a meeting of the Academy of Sciences; had a good turn around the new and immense, but mostly yet unarranged, Natural History Museum with Hauer, the director, and Steindachner, the zoölogical curator; had a look at the Hofherbarium on the upper floor, now under charge of a young man, Beck (and looked up some of Haenke's things there). How different from forty-eight years ago, when Endlicher was curator, Fenzl, assistant, and the former took me out to the Botanic Garden to call on old Jacquin, etc. Steindachner, who was with Agassiz for a year or two at Cambridge, would have us come to his house for our last evening; Süss [1] and frau to meet us, — charming couple; would have been lots more, but we cut it short; had a jolly, pleasant evening. Körner was prevented from coming. He has been asked to take Eichler's [2] place

[1] Eduard Süss; professor of paleontology at Vienna.

[2] A. W. Eichler, 1839–1887; succeeded Alexander Braun at Berlin.

at Berlin; a botanic garden man and good teacher. Weisner's physiological laboratory I had an hour or two in, and saw all his gimcracks; some nice ones. Saturday evening we went by rail to Salzburg (at day-dawn); Munich at sunrise, not stopping; on to Ulm soon after ten A. M. Bad weather kept Mrs. Gray indoors all day Sunday, though I ran about. Monday morning she had with me a good look over Ulm minster, inside and out; the upper part of the spire is rebuilding, and is to be carried up with the true taper, according to the original plan. That sight-seeing done, we came yesterday to, and across, the Lake Constance, to Zurich, for late afternoon and evening, and on to Geneva overnight.

I passed an hour this morning with De Candolle, — aged, but fairly cheerful, — and he begged me to breakfast with him to-morrow. Müller Argoviensis was not at his post.

What a season you have had, and what a fiasco Normandy would have been, as you say. Why, the apple blossoms are only now out here. We did have comfortable, warm and dry weather at Vienna, and the Belvidere gallery is most enjoyable. Berlin we don't in the least care for; but our faces are rather set for Amsterdam, Antwerp, etc. If you have a call to write me soon after getting this, for a day or two you might venture Amsterdam, poste restante; but later the old address, to Hôtel St. Romain, Rue San Roque, would be the thing until further notice; add "To be kept till called for."

I doubt if we shall be back in England before the 17th or 18th, and then Mrs. Gray will have to join her luggage, left somewhere in the neighborhood of Charing Cross, where it now reposes, and we shall have to hasten down to Cambridge. . . .

We have had an enjoyable time; and, I suppose, shall by day after to-morrow set off Rhine-wards, stopping, perhaps, a day at Strasburg, and by the Low Countries back to Paris, probably not to be again on this side of the Channel, unless you and Lady H. will take a trip to Normandy with us, either in August or September.

I hope you will soon have done with Phyllanthus, and that you will not hesitate to restore as many old genera as your own judgment dictates. Your experience and present insight must exceed Bentham's. And what you must needs indicate, the next man will take up, and probably cackle over.

My wife joins in love to yours and you; will be likely to write when she can.

From Geneva the old journey of 1850 was nearly repeated, and Dr. Gray came down the Rhine, by rail this time, to Brussels, Amsterdam, the Hague, back to Antwerp and Brussels, and so to Paris. Besides meeting old friends, the object of the journey, he said, was to have one more good look at picture-galleries and churches and cathedrals; and great was his enjoyment of them, unwearied his wanderings about the places where he stopped. The new galleries at Amsterdam and Brussels, and their superb collections, delighted him, and the grand music of the cathedrals and their noble interiors seemed a new source of pleasure.

He missed his old friends in Paris; Decaisne was gone, and Lavallée, etc. He went to a meeting at the Institute, and saw Chevreuil, who had passed his hundredth birthday, but spoke a few words with life and animation. There were some excursions in the neighborhood, and some work in the herbarium, where he received every kind attention.

TO ———.

PARIS, June, 1887.

. . . The views on the garden and park side of the Palace of Fontainebleau, and over the carp pond, which came up to the walls, were very pretty ; partly clipped and trimmed trees made into green walls, partly more English.

. . . At half past one, in an open light carriage with a canopy overhead, keeping off the hot sun, and letting through the fresh air, we were off for our two hours' drive through the famous forest. The main avenues, long and straight, and formal; but the forest was voted very handsome. A change came when we reached the ruin of the hermitage of Franchard, and the extensive region of rocks and dells. We were taken through by an old guide, who, with much pride, paraded the little and queer English he had picked up, and showed off all the sights, the most important to him being those in which bits of rock could be likened to a lion's head, a beef's tongue, a turtle, and the like. First and foremost, in a sort of overarched grotto, was " La roche qui pleure," a great disappointment! A sort of crack or joint between two layers of the rock exuded a little moisture in one spot; *voilà tout.* We shed about as many tears in our laughter at the sight; more indeed, for we could see not a drop. I dare say at some seasons there may be a little drip. But the dells among the rocks were fine, and the stories of the boar hunts, and all that, by the kings and queens and courtiers, could be made fairly real on the spot, and the famous points of view, one of Maria Theresa, one of Eugénie, were effective. A drive back by another route took us through some older forest; occasionally a really old

tree, and one truly old and large linden. There may be parts in which there are trees as large and venerable as in old English parks, but we saw only this one old tree. The forest is very large, and we had to be content with this one drive. We might have had one hour more of it, for we had all that to wait for our train back to Paris, very pleasant as it cooled at evening.

June 9, I at work at Jardin des Plantes, but back at noon, and at half past twelve we drive across Paris to the Gare de Sceaux and out to Vilmorin's. At Massy, where we leave the railway, Henry de Vilmorin awaited us, with his nice carriage, and took us to the charming place at Verrières, so full to us of recollections. It is prettier than ever, the house enlarged and so full of very nice things. V. and I were most of the time in the grounds, looking at plants, back to afternoon tea and cake, which we much enjoyed, being hungry, and to accommodate us they put forward the dinner hour to six. Besides the children and English governess, we had at dinner a very interesting abbé, with a charming, intellectual face, and a manner to match — a Monsignor; for he takes that title as a member of the Pope's household or personal staff. He had passed a portion of his life at Moscow, as the curé of a French Catholic church there, had seen a good deal of the Roman Catholic bishop of Chicago and other American brothers; was a good deal interested in America, and after the ice was broken and he found he could understand J.'s French, and even mine, which amused as well as instructed him, we had much chat. We had to break off. Vilmorin drove us back a few miles to Fontenay-la-Rose, to take a particular train, and so we were at our

quarters in Rue St. Roche before dark. That need not mean very early, for the days here are wonderfully protracted.

He crossed to England June 14, passed a day or two in London, and then went to the Camp, quite glorious with the rhododendrons in blossom; and with Sir Joseph and Lady Hooker, on the 18th, went to Cambridge, where they were the guests of Mrs. Darwin. A delightful Sunday was spent in meeting old friends, and on Monday were all the ceremonies, new and strange, of conferring of degrees. The great sensation of the day was the presence of the Lord Mayor with all his train; he also was to have a degree. . . . No one can surpass Dr. Sandys in the felicity with which he presents the distinguished men whom Cambridge University honors with its highest degrees. In his presentation of Dr. Gray, he said (we translate from the exquisite Latin):

"And now we are glad to come to the Harvard professor of Natural History, facile princeps of transatlantic botanists. Within the period of fifty years, how many books has he written about his fairest science; how rich in learning, how admirable in style! How many times has he crossed the ocean that he might more carefully study European herbaria, and better know the leading men in his own department! In examining, reviewing and sometimes gracefully correcting the labors of others, what a shrewd, honest and urbane critic has he proved himself to be! How cheerfully, many years ago, among his own western countrymen was he the first of all to greet the rising sun of our own Darwin, believing his theory of the origin of various forms of life demanded some First

Cause, and was in harmony with a faith in a Deity who has created and governs all things! God grant that it may be allowed such a man at length to carry to a happy completion that great work, which he long ago began, of more accurately describing the flora of North America! Meanwhile, this man who has so long adorned his fair science by his labors and his life, even unto a hoary age, 'bearing,' as our poet says, 'the white blossom of a blameless life,' him, I say, we gladly crown, at least with these flowerets of praise, with this corolla of honor (his saltem laudis flosculis, hac saltem honoris corolla, libenter corona-mus). For many, many years may Asa Gray, the venerable priest of Flora, render more illustrious this academic crown."

England was in a stir with the Queen's Jubilee; it was impossible to be in London on the twenty-first, as Dr. Gray must get to Oxford to receive his degree on the twenty-second, and a good part of the day was used in crossing country by various railroads; but the sight of the crowds, the decorations, the bands everywhere, was very interesting, and the enthusiasm contagious. Oxford had its gay share of illumination in the evening, and the next day Dr. Gray received his degree with several others, among them his old Cambridge acquaintance, Story, the sculptor.

TO ——.

BLACHFORD, Sunday, July 2.

. . . I am to add some supplementary notes.

At the Cambridge University lunch, I had Mrs. Jebb assigned to me to take in. Oscar Browning took the seat on my right. Opposite was a man I was

glad to see, Lord Acton, — middle-aged, of high scholarship and admirable taste, who fought a long and losing battle against the superstitious tendencies of his (Roman Catholic) church; and after lunch I had a pleasant conversation with him; was glad to find he was one of the new D. C. L. crew at Oxford, where I again saw something of him. He has been in the United States when only a baronet.

At the Oxford Christ Church dinner I was placed at the high table, only two away from the Dean's left, the two Dr. Jellett, provost of Trinity College, Dublin (who was doctored), and the bishop of Gibraltar. On my left was Talbot, the warden of Keble College (the very high church one), and I know little of what I ate or drank, for we had a steady stream of conversation on high topics, treated with immense frankness on both sides. Dr. Jellett made the return-thanks speech for all four of the new-made Doctors present, — himself, Story, Dr. Wright, Arabic professor at Cambridge, and myself, a speech full of Irish humor. That was arranged to be all. But the lower tables somehow knew by instinct what Story wanted, and called him out. He made a rather funny speech. Then Liddon had to move thanks to the president of the feast, the Dean (Liddell), and a capital speech he made, even to my apprehension. I saw that there was a good deal between the lines in what he was saying, but did not know the half of it till I was told afterwards. Paget, my host, was opposite me. Prestwich, whom I had not before got sight of, was next him. It was a long affair, but very pleasant to me.

Next morning was the call on Professor Bartholomew Price and wife, in a charming old house, meeting Tylor and Maspero; then we went to the Museum,

giving our time there to the new well-contrived Pitt-River Museum of Ethnology; then walked to Acland's and made a long call on his daughter, who seemed pleased, and we certainly were to see her again, and looking well, though a sufferer and invalid. The dinner at Balfour's, J. will describe.

Friday, at ten o'clock, the Hookers called with a carriage, and we drove to Nuneham, seven miles, where Colonel Harcourt, older brother of Sir William Harcourt, had invited us to see the place and lunch. It is one of the principal seats of the Harcourt family, — not the oldest, which is on the Thames much higher up — and is in view from the railway to London, a handsome but externally rather plain pile, and so full of remarkable things. As soon as we arrived we were shown through most of the house by Colonel H., and some of the historical curiosities were brought out. . . . There is an unparalleled gallery of original portraits of British poets, mostly given by themselves, almost all of them. . . .

The "omnibus" had been ordered, and we drove through the park, into the arboretum, and through it by winding roads were landed at the conservatory and gardens, the dairy, the ornamental grounds, filled with statues, etc., inscriptions in verse and prose set up by the wits of the times of George II. and III. In the house we were shown some of the letters, of which there is a vast quantity, now being sorted and arranged in volumes and indexed. One volume is of those of George III., beginning with those when a small boy, and badly spelled, ending with some when an old man and insane. Then a walk along the terrace and the side commanding the fine views, from some points Oxford dimly seen in the distance; then the lunch.

Our carriage was announced, and we took leave, a shorter way through the park being pointed out. Got back to Oxford just in time to take leave of H. (her husband out) and take a fly to train, and so to London; separated from the Hookers, who had to take a slip car, to be dropped at Reading. We went straight to Paddington without stop, and thence in a cab to the Deanery, where our dear good friends awaited us.

Saturday afternoon, we were all going with the Churches to the Archbishop of Canterbury's garden party at Lambeth Palace, when, at breakfast, Mrs. C. got an invitation from Mrs. Gladstone to hers, at Dollys Hill, up near Harrow, and the question of dividing forces came up. It was settled, as I wished, by Mrs. C., Fred, and I going by underground to the Gladstones, while J. and the Misses C. went by carriage to Lambeth. Mrs. Gladstone sent her carriage down to the station, a mile off, which took us up to a pleasant country house, which some one (I think Lord Aberdeen) has lent to the G. O. M. It was all lucky for me. At Oxford, Bryce had asked me to his dinner for July 6, where he said Gladstone wanted to meet me, and our engagements here made that impossible. At the garden party, while we were there, the people were few and a good chance to talk. Mrs. Gladstone was most gracious. Gladstone said he was very glad to see me in the flesh, and we had pleasant talk, of nothing in particular. Lord Granville sought an introduction, asked Lowell, who was there, to introduce him, and then introduced his brother, Lord Leveson Gower, and afterward his son. Then I was put at the tea-table at the side of Miss Gladstone, the principal of Newnham College at Cambridge, a most bright and pleasant person; and after

a long talk, a lady with a very pleasant and handsome face pushed in a chair between us and asked an introduction, — Lady Lyttleton. . . . I met her next day at evening, at Mr. Talbot's (M. P.) house, where I went to be taken to a good seat at St. Margaret's Church, Westminster, now serving for the Abbey, to hear Talbot, the warden of Keble, preach.

Sunday morning, to continue my separate doings, I went to the Temple Church, to hear the very sweet music, better in my opinion than that of St. Paul's, and to hear the chaplain (Master is his proper title), Vaughan. Capital sermon it was. Afternoon I was quiet. At seven o'clock I went to Westminster to hear Talbot, the warden of Keble. These very high clergymen have a way of preaching broad-minded sermons. Talbot's might have been preached by Phillips Brooks, or even by A. P. Peabody, except for an incidental phrase or two, and except for some posturing at the prayers. So my idea of the man, as a man of excellent sense, in spite of his setting in a very superstitious school, was confirmed.

Tyndall dinner; here as a guest, I was the third on the left of the chairman (Stokes, president of Royal Society), only Lord Bathurst and Lord Derby between. The speaking I thought heavy enough, except for Lord Derby's speech, which was pointed and witty, and Lord Rayleigh's, at the end, which was neat and sensible. Met there (in Willis's Rooms; the dinner was in the Almack's ballroom of old days) a good many old acquaintances, and of course had a good time.

From London, after more entertainments, Dr. Gray went to Devonshire, where he made a charming visit at

Blachford with his friends Lord and Lady Blachford; most interesting excursions followed over the downs, a day up the Tamar to Cothele; and he made other visits on the way back, one to his old Cambridge friend, Mrs. James, near Exeter, where he had an afternoon call at Killerton, Sir Thomas Acland's, and saw the fine beeches, etc.; returned to London, where there was much visiting before he went to Edinburgh for another degree. On the way to the north he visited the grounds of Welbeck, and saw the fine trees of Sherwood (Robin Hood's) forest, — beeches, and grand, hoar old oaks.

From Edinburgh Dr. Gray went through England to Normandy, meeting Sir Joseph Hooker and his party at Rouen; then came a delightful trip given to churches and cathedrals.

He wrote: "Bayeux and Coutances surprised us, they are so very good; only Amiens and St. Ouen can compare with them in beauty, especially interior views.

"No two of all these Normandy churches are alike; even those of essentially similar style differ both within and without so much that you would not wish to miss any one. Those old church builders were geniuses, and worked by inspiration."

He gave a day to Mont St. Michel, and then separating from the Hookers he went to Chartres, to see it again after thirty years, and by Rouen and Amiens returned to England; when came an interesting visit to Harpenden to Dr. and Mrs. Gilbert, viewing the famous experiments in agriculture at Rothampstead. And the seeing of cathedrals was closed by a most delightful and busy day at Canterbury with Canon and Mrs. Fremantle.

At the end of August he went to Manchester to

attend the meeting of the British Association, and he and Mrs. Gray were guests of Professor Williamson; De Bary and M. de Saporta being also under the same hospitable roof. It was an unusual assemblage of botanists, and a very enjoyable occasion.

Dr. Gray seconded Sir Henry Roscoe's address at the opening of the meeting with this short speech: —

"For the very great honor of being called upon to second the motion for a vote of thanks to your illustrious president, I am mainly indebted to that deference which is naturally accorded to advancing years; a deference which sometimes, as in the present case, takes one unawares.

"In looking over the list of Corresponding Members of the British Association, I find myself, much to my surprise, nearly, if not quite, the oldest survivor.

"I recognize, therefore, a certain fitness, on this score, in the call upon me to be the spokesman of those, your brethren from other lands, who have been invited to this auspicious gathering, and to the privilege of listening to the very thoughtful, well-timed, and most instructive address of your president.

"As guests, we desire, Mr. Mayor, heartily to thank the City of Manchester and the officers of the Association for inviting us; we wish to thank you, Sir Henry, for the gratification your address has afforded us.

"Convened at Manchester, and coming myself by way of Liverpool, I would say, personally, that there are two names which memory calls up from the distant past, with unusual distinctness, both names familiar to this audience, and well-known over the world, but which now rise to my mind in a very

significant way. For I am old enough to have taken my earliest lessons in chemistry just at the time when the atomic theory of Dalton was propounded and was taught in the text-books as the latest new thing in science. Some years earlier, Washington Irving, in his Sketch-book, had hallowed to our youthful minds the name of Roscoe, making it the type of all that was liberal, wise, and gracious. And when I came to know something of botany, I found that this exemplar as well as patron of good learning had, by his illustrations of monandrian plants, taken rank among the *patres conscripti* of the botany of that day.

"The name so highly honored then we now honor in the grandson. And I am confident that I express the sentiments of your foreign guests whom I represent, when I simply copy the words of your president in 1842, now reproduced in the opening paragraph of the address of the president of 1887, transferring, as we fitly may, the application from the earlier to the later Manchester chemist.

"'Manchester is still the residence of one whose name is uttered with respect wherever science is cultivated, who is here to-night to enjoy the honors due to a long career of persevering devotion to knowledge.'

"I cannot continue the quotation without material change. 'That increase of years to him has been but increase of wisdom,' may, indeed be said of Roscoe no less than of Dalton; but we are happy to know that we are now contemplating not the diminished strength of the close, but the manly vigor of the mid-course of a distinguished career. Long and prosperously may it go on from strength to strength.

"In general, praise of the address which we have had the pleasure of hearing would not be particularly

becoming from one whose chemistry nearly ended as well as began with the simple atomic theory of Dalton. But there is one topic which I may properly speak of, standing as I do as a representative of those favored individuals which your programme, for lack of a better distinguishing word, calls 'foreigners.' I refer to the urgently expressed 'hope that this meeting may be the commencement of an international scientific organization.' For this we thank you, Mr. President, most heartily. This is, indeed, a consummation devoutly to be wished, and confidently to be hoped for by all of us, especially by those for whom I am speaking.

"Not only we Americans, who are of British descent, and who never forget that blood is thicker than water, but as well our Continental associates on this platform, of the various strains of blood which, interfused, have produced this English race and fitted it for its noble issues, — we, each and all, I repeat, accept this name of 'foreigners' only in the conventional sense which the imperfection of the language imposes. In the forum of science we ignore it altogether. One purpose unifies and animates every scientific mind with 'one divine intent,' and that by no means the 'far-off intent' of which the poet sings, but one very near and pervading. So we took to heart the closing words of your president's most pertinent and timely address. Indeed, we had taken them to heart in anticipation, and so have come to this meeting, one hundred strong or more (in place of the ordinary score) fully bent upon making this Manchester meeting international.

"Far back in my youthful days there was a strong-willed President of the United States, of military antecedents, who once drew up and promulgated an

official order which somewhat astounded his cabinet officers. 'Why, Mr. President,' they said, 'you can't do that.' 'Can't do it?' replied General Jackson; 'Don't you see that I have done it?' And so we internationals have come and done it. I am the unworthy spokesman of such a numerous and such a distinguished array of scientific foreigners as have never been assembled before. Next year, if you will, you shall have as many more. When you too are ready to cross the Channel or the North Sea, we shall compose only a larger scientific brotherhood. And when you cross again the Atlantic, the brotherhood of science will be the more increased, and its usefulness in proportion.

"In behalf of your foreign guests, I heartily second the motion."

From Manchester Dr. Gray went to Failand, to his friend Sir Edward Fry; then followed a visit to Miss North, in Gloucestershire, where he met, among others, Mr. and Mrs. Elwes,[1] and drove one day to Tortworth to lunch with Lord and Lady Ducie; then to Kew. A few days there with his kind friends, Dr. and Mrs. Oliver, a farewell visit to his old friend, Miss Sullivan, at Broom House, to the Camp to say good-by to the Hookers, and finally to Liverpool to sail in the Pavonia, October 7. Just six months, as Dr. Gray said, of wonderful enjoyment and success; everything had gone as it should, there were no mishaps, the days had run on as each had been planned, and he came home in wonderful vigor and spirits.

[1] Henry John Elwes, author of the sumptuous monograph of the genus Lilium.

CAMBRIDGE, October 24, 1887.

DEAR REDFIELD, — Thanks, many, for letter of the 22d. . . .

We have had "a good time," and after long play I am getting down to work. . . .

Thanks to you all for your congratulations, in which my good wife sincerely joins.

Yours affectionately, ASA GRAY.

HERBARIUM OF HARVARD UNIVERSITY.
BOTANIC GARDEN, CAMBRIDGE, MASS., October, 1887.

DEAR HOOKER, — Your welcome letter in this morning. I was just writing a notice of Ampelideæ, and your remarks are in time for me to sharpen it up a bit. I think I can smash his notice about Ampelopsis.

Who is Miss Grant, who says she knows you both? She sculps, I believe. Ever yours,

A. GRAY.

There was much to do on getting home and settling down again, and many things were planned for the winter's work. Dr. Gray particularly wished to write some accounts of the old botanists he had seen in his earlier visits, being stirred thereto by Reichenbach[1] of Hamburg, and by the stories he told one evening at Dr. Oliver's, at Kew, when all agreed it was a pity some of these characteristic things should not go on record. He took up work on the "Flora," wrote a review of "Darwin's Life and Letters," and had a busy time before him.

Professor Baird, director of the Smithsonian, and an

[1] Heinrich Gustav Reichenbach, 1823–1889; professor of botany at Hamburg, and an authority on orchids.

old friend, had died during the summer, and Dr. Gray, from his long connection with the institution, was much interested in the appointment of his successor. He went on in November to Washington to a special meeting of the Regents, when Professor Langley was appointed; wrote from Washington of the wonderful amount he had done in one day, and hurried back; liking always, if he could, to surprise those at home by being somewhat earlier than he had promised. He began the Annual Necrology for the "American Journal of Science." He was already at work on the Vitaceæ for the "Flora."

He went in to Boston for the family Thanksgiving dinner, though there had seemed some threatening of a cold, but he pronounced himself perfectly comfortable. Still there was a quick breathing and some listlessness, so that he was nursed a little on Friday; though he saw Miss Murfree, who had been brought by Mrs. Houghton to ask him to settle some question about a flower of the Southern Alleghanies, and he entered into the matter with all his old life and eagerness. That evening he had two slight chills, so that the doctor was summoned the next day, and fearing some chest trouble, as he seemed threatened with one of his bronchial attacks, advised him to keep in bed. On Sunday his pulse and temperature had improved so much that he was allowed to get up and go down stairs at noon, the doctor congratulating him on the success of the treatment. There seemed a weakness of the right hand, which, however, passed away, and he wrote that evening the letter to Dr. Britton, which follows, and when remonstrated with for making the exertion, said "it was important and must be written."

Sunday Evening, November 27, 1887.

DEAR DR. BRITTON, — I wish to call your attention either in a personal way or in the "Bulletin," if preferred, to a name coined by you on the 223d page of this year's "Bulletin."

"Conioselinum bipinnatum (Walter, Fl. Car. under Apium), Britton, Selinum Canadense, Michx., 1803."

I want to liberate my mind by insisting that the process adopted violates the rules of nomenclature by giving a superfluous name to a plant, and also that in all reasonable probability your name is an incorrect one.

Take the second point first. On glancing at the "Flora of North America," of Torrey and Gray, 1, 619, where the name Conioselinum Canadense legitimately came in, you will notice that the name Apium bipinnatum, Walt., is not cited as a synonym; also that the synonymous name of Cnidium Canadense, Spreng., is cited with "excl. Syn." This Apium bipinnatum, Walt., you might gather was one referred to. Sufficient reason for the exclusion by Dr. Torrey might have been that Michaux's plant is a cold northern one, which nobody would expect in or near Walter's ground — the low and low middle part of Carolina. Besides, the preface of that "Flora" states that Walter's herbarium had meanwhile been inspected by Dr. Torrey's colleague, who may now add that the Apium bipinnatum is not there. So that the name you adopt rests wholly upon a mere guess of Sprengel's, copied by De Candolle, dropped on good grounds by Torrey, but inadvertently reproduced in Watson's "Index," copying De Candolle. I suppose you would not contend that a wholly unauthenticated and dubious (I might say, doubtless mistaken) name, under

a wrong genus, should supersede by its specific half a well-authenticated and legitimate name. And I am sure that you will not take it amiss when I say that very long experience has made it clear to me that this business of determining rightful names is not so simple and mechanical as to younger botanists it seems to be, but is very full of pitfalls. I trust it is no personal feeling which suggests the advice that it is better to leave such rectifications for monographs and comprehensive works, or at least to make quite sure of the ground.

We look to you and to such as yourself, placed at well-furnished botanical centres, to do your share of conscientious work and to support right doctrines. So I may proceed to say that, upon the recognized principles since the adoption of the Candollian code, your name of Conioselinum bipinnatum, even if founded in fact, would be inadmissible and superfluous. By a corollary of the rule that priority of publication fixes the name, taken along with the fact a plant-name is of two parts, generic and specific, it follows that in any case, Conioselinum Canadense is the prior name for those who hold to the genus Conioselinum. I have laid down what I take to be the correct view as to this, in my "Structural Botany," paragraph 794, where it is supported by the high authority of Bentham. I believe it is more and more acceded to by the most competent judges. There are those who make transpositions of divorced halves of plants name, and who, also make the law of priority mechanically override other equally valid laws, without regard to sense. To such the old law maxim of the elder De Candolle was applied ; *summum jus, summa injuria.* If you like to adopt their ideas, you have at

hand a still older, the very oldest, name, namely, Conioselinum Chinense, for I can certify that the plant we are concerned with is Athamantha Chinensis of Linnæus.

Very truly yours,

Asa Gray.

The next morning he seemed bright and well, but on going down to breakfast there came a slight shock in the right arm, which seemed, however, to pass off after he had rested. He managed to put up, for two friends in England, copies of his "Review of the Life of Darwin," in the "Nation," penciling the address so that it could be read. But a more severe shock returned in the early afternoon, and for a few moments a loss of articulation. That disappeared and the physician looked hopefully at the case, though recommending extreme quiet for mind and body. By Wednesday evening he seemed greatly improved, but the next morning the power of connected speech had gone. He could repeat words spoken to him, and could sometimes, apparently with long striving, connect the wish and the words, but for the most part he had lost the power of using the word he wanted, and could only express himself with signs, and his "eloquent left hand;" for the paralysis gradually increased until the whole right side was helpless. He lingered patiently in much weakness and at times suffering, until the 30th of January, 1888, when he gradually sank and quietly passed away at half-past seven in the evening.

Dr. Gray was buried in Mount Auburn, February 2, where a simple stone, bearing a cross, marks his grave, with his name and the dates 1810–1888.

APPENDIX.

A. DR. GRAY'S WILL.

Dr. Gray in his will left to the herbarium the proceeds of all his copyrights. His strong belief in the importance of a large and well-kept herbarium, as an establishment indispensable not only to the development of botanical studies at Harvard but also to the diffusion throughout the whole country of a knowledge of its flora, is shown by this bequest, and also by the active efforts he was constantly making in its behalf during his life and by the personal sacrifices to which he cheerfully submitted, that the herbarium might profit. Some of the difficulties in the development of his cherished project will already have suggested themselves to the reader of these pages. Others may be touched upon briefly here.

The reputation of Dr. Gray at home and abroad naturally served to draw to the herbarium large numbers of specimens, and the number was increased by the purchases which he contrived to make from time to time, either from his own scanty means, or from the occasional gifts of friends. The storing of his large and valuable collections in the small house in the garden where he lived was attended by so much danger of destruction by fire that he offered to present the collection to Harvard University, if a suitable building for its reception were provided; and, greatly to his relief, his herbarium was transferred in 1864 to the new fire-proof building, for whose construction twelve thousand dollars were given by his liberal friend, Mr. Nathaniel Thayer.

If Dr. Gray was able during his life to secure a building which at the time of its completion seemed ample for its purpose, he was less fortunate in his efforts to obtain a

permanent fund for the maintenance of the collection. In 1864, the sum of $10,000 – $12,000 was raised by friends for its support; but the interest of all the available funds was far short of what was necessary for the proper payment of a curator, for necessary purchases of plants and books and for running expenses. In fact, during his lifetime, running expenses could not have been met had it not been for occasional gifts from friends of the herbarium, including, for several years, a grant from the Massachusetts Society for the Promotion of Agriculture. The bequest in his will was an attempt on his part to replace, as far as he was able, the sums obtained by him annually from various sources during his life. But even with the amount derived from the copyrights, which must, of necessity, diminish in future years, the endowments of the herbarium are by no means sufficient to provide for its maintenance, even on the present scale. At the time of the transfer in 1864, the herbarium contained at least two hundred thousand specimens, and the library between two and three thousand works. Both have increased largely since that date.

B. A PARTIAL LIST OF THE WRITINGS OF ASA GRAY.

1. Text-Books and Independent Volumes.

1836. Elements of Botany. New York.

1838–1843. Flora of North America, Torrey and Gray. Vol. I. 1838–1840; vol. II. 1841–1843.

1842. Botanical Text-Book. New York. Subsequent editions were as follows: Second, 1845; third, 1850; fourth, 1853; fifth (Introduction to Structural and Systematic Botany), 1857; second issue, 1860; sixth, part 1 (Structural Botany or Organography on the basis of Morphology), 1879.

1848. Manual of the Botany of the Northern United States. Subsequent editions were as follows: Second, 1856; third, 1859; fourth, 1863; fifth, 1867; second issue, 1868, 4 pp. added.

1848–1849. Genera Floræ Americæ Boreali-Orientalis Illustrata, I. 1848; II. 1849. New York.

1854. United States Exploring Expedition, Botany. Part I. Philadelphia.

1857. First Lessons in Botany and Vegetable Physiology. New York. Revised August, 1868.

1858. How Plants grow, with a popular Flora. New York.

1868. Field, Forest, and Garden Botany. Second edition, 1870.

1872. How Plants behave. New York.

1876. Darwiniana: Essays and Reviews pertaining to Darwinism. New York. Collected from the Atlantic, The Nation, Am. Jour. Sci., Am. Sci. Assoc., Nature, N. Y. Tribune.

1878–1886. Synoptical Flora of North America. Vol. II. part 1, 1878. Second edition, 1886. Cambridge. Vol. I. part 2, 1886. Washington.

1880. Natural Science and Religion, Two Lectures. New York.

1887. Elements of Botany. New York.

1889. Scientific Papers of Asa Gray, selected by Charles Sprague Sargent; in two volumes. I. Reviews of Works on Botany and related subjects, 1834–1887. II. Essays, Biographical Sketches, 1841–1886. Boston.

2. Contributions to Publications of Societies.

Annals of the New York Lyceum —

1835. A monograph of the North American species of Rhynchospora. III. 191–238 (reprint, 191–236).

1837. Melanthacearum Americæ Septentrionalis Revisio. IV. 105–140.

Memoirs of the American Academy of Arts and Sciences —

1846. Chloris Boreali-Americana. Illustrations of new, rare, or otherwise interesting North American plants. Decade I. III. 1–56, pl. 1–10.

1849. Plantæ Fendlerianæ Novi-Mexicanæ. IV. 1–116.

1854. Plantæ Novæ Thurberianæ. N. s., V. 297–328.

1859. Diagnostic characters of new species of phænogamous plants, collected in Japan by Charles Wright, botanist of the United States North Pacific Exploring Expedition. With observations upon the relations of the Japanese Flora to that of North America, and of other parts of the Northern Temperate Zone. VI. 377–452.

1859. On the genus Croomia, with plate. VI. 453–457.

Proceedings of the American Academy of Arts and Sciences —

1846. Characters of some new genera or species of Compositæ from Texas. I. 46–50.

1853. Characters of some new genera of plants, mostly from Polynesia. III. 48–54, 127–129.

1857. On the age of a large Californian coniferous tree. III. 94–97.

1861. Characters of some Compositæ in the collection of the United States South Pacific Exploring Expedition. V. 114–146.

1861. Enumeration of a collection of dried plants made by L. J. Xantus in Lower California. V. 153–173.

1861. Characters of new or obscure species of plants of Monopetalous orders in the collection of the United States Pacific Exploring Expedition. V. 321–352 ; VI. 37–55.

1864. A revision and arrangement (mainly by the fruit) of the North American species of Astragalus and Oxytropis. VI. 188–236.

1865. Characters of some new plants of California and Nevada, from the collections of Prof. William H. Brewer and Dr. Charles L. Anderson. VI. 519–556.

1870. A revision of the Eriogoneæ (with J. Torrey). VIII. 145–200.

1870. Reconstruction of the order Diapensiaceæ ; revision of the North American Polemoniaceæ ; miscellaneous botanical notes and characters. VIII. 243–296.

1872. Notes on Labiatæ ; determinations of a collection of plants made in Oregon by Elihu Hall. VIII. 365–412.

1873. Characters of new genera and species of plants. VIII. 620–631.

1873. Notes on Compositæ and characters of certain genera and species, etc. VIII. 631–661.

1874. Notes on Compositæ and characters of certain genera and species. IX. 187–218.

1874. A synopsis of the North American Thistles ; notes on Borraginaceæ ; synopsis of North American species of Physalis ; characters of various new species. X. 39–78.

1875. A conspectus of the North American Hydrophyllaceæ. X. 312–332.

1876. Characters of Canbya (n. gen.) and Arctomecon ; characters of new species. With two plates. XII. 51–84.

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1862. Plants from Texas by S. B. Buckley. 161–168 ; 332–337.

1863. Plants collected by Hall & Harbour and C. C. Parry. 55–80.

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1859. Report of the United States and Mexican Boundary Survey made by W. H. Emory. Pp. 34, 73–107, 110–121, 154, 172–175, with five plates.

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4. Contributions to Periodicals.

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1844. The Longevity of Trees. July. 189–238.

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1841. Notices of European Herbaria, particularly those most interesting to the North American Botanist. XL. 1–18. Notice of the Botanical Writings of C. S. Rafinesque. XL. 221–241.

1842. Notes of a botanical excursion to the mountains of North Carolina, etc., with some remarks on the Botany of the higher Alleghany Mountains. XLII. 1–49.

1846. Analogy between the Flora of Japan and that of the United States. II. ii. 135–136.

1849. Notice of Dr. Hooker's Flora Antarctica. II. viii. 161–180.

1853. On some new genera and species of Nyctaginaceæ. II. xv. 259–263 ; 319–324.

1854. Introductory Essay, in Dr. Hooker's Flora of New Zealand, vol. I. II. xvii. 241–252 ; 334–350.

1854. On the age of the large tree recently felled in California. II. xvii. 440–443.

1855. The Smithsonian Institution. II. xx. 1–21.

1856. Statistics of the Flora of the Northern United States. II. xxii., 204–232 ; xxiii. 62–84 ; 369–403.

1856. De Candolle's Géographie Botanique Raisonnée. II. xxii. 429.

1859. Obituary Notice of Brown and Humboldt. II. xxviii. 161–165.

1860. Review of Darwin's Theory on the Origin of Species by means of Natural Selection. II. xxix. 153–184 ; Darwiniana, pp. 9–61.

1860. Design versus Necessity. II. xxx. 226–239 ; Darwiniana, pp. 62–86.

1862. Enumeration of Rocky Mountain Plants. II. xxxiii. 237–243 ; 404–411 ; II. xxxv. 249–253 ; 335–341.

1862. Hooker's Outlines of the Distribution of Arctic Plants, etc. II. xxxiv. 144.

1863. Review of De Candolle's "Species as to Variation, Geographical Distribution and Succession." II. xxxv. 431 ; Darwiniana, pp. 178–204.

1864. On Scientific Nomenclature. II. xxxvii. 278–281.

1865. Darwin's Movements and Habits of Climbing Plants. II. xl. 273 ; xli. 125.

1868. Remarks on the Laws of Botanical Nomenclature. II. xlvi. 74–77.

1872. Sequoia and its history ; the relations of North American to Northeast Asian and to Tertiary Vegetation. III. iv. 282–298 ; (Darwiniana, pp. 205–235 ; also, Proc. American Association for the Advancement of Science, with Corrections and Appendix. XXI. 1–31).

1875. Do Varieties wear out or tend to wear out? III. ix. 109–114.

1875. Bentham on the Recent Progress and Present State of Systematic Botany. III. ix. 288–294; 346–355.

1875. Æstivation and its Terminology. III. x. 339–344.

1877. Notice of Darwin on the "Effects of Cross and Self Fertilization in the Vegetable Kingdom." III. xiii. 125–141.

1877. Notes on the History of Helianthus tuberosus. III. xiii. 347–352; xiv. 428–429.

1878. Forest Geography and Archæology. III. xvi. 85–94; 183–196.

1878. De Candolle's New Monographs. III. xvi. 325; xxxiv., 490.

1878. Shortia galacifolia rediscovered. III. xvi. 483–485.

1879. Pertinacity and Predominance of Weeds. III. xviii. 161–167.

1880. De Candolle's Phytography. III. xx. 150, 241.

1881. C. Darwin and F. Darwin, "Power of Movement in Plants." III. xxi. 245.

1882. Remarks concerning the flora of North America. III. xxiv. 321–331.

1883. Review of De Candolle's Origin of Cultivated Plants. III. xxv. 241–255; 370–379; xxvi. 128–138.

1883. Points in Botanical Nomenclature; a review of De Candolle's "Nouvelles Remarques sur la Nomenclature Botanique." III. xxvi. 417–437.

1884. Gender of Names of Varieties. III. xxvii. 396–398.

1884. Characteristics of the North American flora. III. xxviii. 323–340.

NOTE. During the fifty and more years Dr. Gray was a contributor to the "American Journal of Science," in addition to the foregoing articles, he printed in its pages 380 communications, devoted chiefly to critical reviews of works on botany and kindred subjects, and to biographical sketches of botanists. In 1888 appeared, as an appendix to Volume XXXVI., a list of 42 pages of the writings of Asa Gray, chronologically arranged. This list, with an index, has been issued in separate form. In addition to the above, Dr. Gray contributed to the "Nation" from 1868 to November, 1887; and many articles to the following journals and magazines: The New York Semi-

Weekly Tribune ; The American Agriculturist ; Hooker's Journal of Botany ; The London Journal of Botany ; Journal of the Linnæan Society ; Gardener's Chronicle ; American Naturalist ; Science ; The New York Independent ; The Botanical Gazette ; The Bulletin of the Torrey Botanical Club ; The American Florist ; The Examiner ; The New Englander ; The Atlantic ; The Literary World ; The Contemporary Review ; The Andover Review ; The Harvard College Literary Bulletin.

One publication, and that the earliest, cannot be included in any of the above divisions. It was entitled "A Catalogue of the indigenous Flowering and Filicoid Plants growing within 20 miles of Bridgewater, Oneida Co., New York." It is signed A. Gray, M. D., January 1, 1833, and constitutes pp. 57–65 of (N. Y.) Senate Document, No. 70.

C. DEGREES CONFERRED ON ASA GRAY.

1831. College of Medicine and Surgery, Fairfield, N. Y. M. D.
1844. Harvard College. M. A.
1860. Hamilton College, Clinton, N. Y. LL. D.
1875. Harvard University. LL. D.
1884. McGill College, Montreal, Canada. LL. D.
1887. University of Michigan. LL. D.
1887. Cambridge University, England. D. S.
1887. University of Oxford, England. D. C. L.
1887. University of Edinburgh, Scotland. LL. D.

D. SOCIETIES OF WHICH DR. GRAY WAS A MEMBER.

1835. Cæsarea Leopoldino-Carolinæ Academiæ Naturæ Curiosorum Vratislaviensis, Breslau. Mem.
1836. Die Königliche Botanische Gesellschaft in Regensburg. Mem.
1836. Academy of Natural Sciences of Philadelphia. Corresp. Mem.
1837. Boston Society of Natural History. Corresp. Mem. and Hon. Mem.
1841. American Academy of Arts and Sciences. Fellow.

1846. Acad. Literarum et Scientiarum Regia Boica, Munich. Hon. and Corresp. Mem.
1847. Massachusetts Hort. Society. Corresp. Mem.
1847. Essex Co. Massachusetts Natural Hist. Soc. Corresp. Mem.
1848. Regia Scientiarum Societas, Upsal. Mem.
1848. Am. Philosophical Society, Philadelphia. Mem.
1849. Die Pollichia, Ein Naturwissenchaftliche Verein der Bayerischen Pfalz. Mem.
1849. Senkenbergische Naturforschende Gesellschaft zu Frankfort-am-Main. Mem.
1850. Linnæan Soc. of London. Foreign Mem.
1850. Société de Physique et d'Histoire Naturelle de Genève. Hon. Mem.
1851. Vereeniging voor de Flora van Nederland. Corresp. Mem.
1852. British Assoc. for the Advancement of Science. Corresp. Mem.
1852. Lyceum of Natural History, New York. Hon. Mem.
1852. Der Naturwissenschaftliche Verein in Hamburg. Hon. Mem.
1853. Philadelphia College of Pharmacy. Hon. Mem.
1853. Polk Co. Agricultural Society, Iowa. Mem.
1854. Kaiserlich Königliche Geologische Reichsanstalt, Vienna. Corresp. Mem.
1854. Société Impériale des Sciences Naturelles de Cherbourg. Corresp. Mem.
1855. Regia Scientiarum Academia Borussica. Corresp. Mem.
1857. California Academy of Natural Sciences. Hon. Mem.
1857. Société de Botanique de Leyden. Corresp. Mem.
1858. Dublin University Zoological and Botanical Association. Corresp. Mem.
1858. Historical Society of Tennessee. Hon. Mem.
1859. Regia Scientiarum Academia Sverica, Stockholm. Foreign Mem.
1859. Imperial Society of Botany, Moscow. Mem.
1859. Russian Society of Horticulture, St. Petersburg. Mem.
1860. Cleaveland Natural History Soc. of Bowdoin College (Maine). Hon. Mem.

1861. Botanical Society of Canada. Hon. Mem.
1862. Imperial Academy of Sciences, St. Petersburg. Corresp. Mem.
1863. Natural History Society of Dublin (union with Dublin University Nat. Sci. Association). Corresp. Mem.
1863. National Academy of Sciences of the United States. Mem.
1865. K. K. Zoologisch-Botanische Gesellschaft in Wien. Mem.
1866. Am. Microscopical Society of the City of New York. Hon. Mem.
1866. Royal Botanical Society of Edinburgh. Hon. Fellow.
1867. National Academy of Sciences of the United States. Hon. Mem.
1867. Buffalo Historical Society. Corresp. Mem.
1868. Die Königliche Gesellschaft der Wissenschaften zu Göttingen. Corresp. Mem.
1868. Société Impériale Académique de Cherbourg. Corresp. Mem.
1871. Indianapolis Academy of Sciences. Hon. Mem.
1873. Minnesota Academy of Natural Sciences, Minneapolis. Hon. Mem.
1873. The Royal Society, London. Foreign Mem.
1875. Royal Irish Academy, Dublin. Hon. Mem.
1876. Worcester Co. Horticultural Society. Hon. Mem.
1877. Société Royale de Botanique de Belgique. Assoc. Mem.
1877. Davenport Academy of Natural Sciences, Iowa. Hon. Mem.
1878. Institut de France, Académie des Sciences. Corresp. Mem.
1879. Royal Society of Edinburgh. Mem.
1880. The Cambridge (England) Philosophical Society. Hon. Mem.
1884. Der Botanische Verein der Provinz Brandenbourg. Hon. Mem.
1884. Die Deutsche Botanische Gesellschaft, Berlin. Hon. Mem.
1885. The Philosophical Society of Glasgow. Hon. Mem.
1885. Natural History Society of Montreal. Hon. Mem.
1885. New Zealand Institute. Hon. Mem.
1885. Royal Horticultural Society, London. Hon. Mem.

1886. Northwestern Literary and Historical Society, Sioux City. Hon. Mem.
1886. American Society of Naturalists. Hon. Mem.
1886. Oneida Co. Horticultural Society at Utica, N. Y. Corresp. Mem.
1886. Asa Gray Botanical Club, Utica, N. Y. Mem.
1886. Torrey Botanical Club, Columbia College, New York. Hon. Mem.
1887. La Société Botanique de Copenhague. Hon. Mem.
1887. Manchester (England) Literary and Philosophical Society. Hon. Mem.
1887. The Essex Institute, Salem, Mass. Hon. Mem.

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